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THE PRACTICAL PHOTOGRAPHER

LIBRARY SERIES EDITED BY REV. F. C. LAMBERT, M.A.

NUMBER 3

The Pictorial Work
of
Will A. Cadby.

Lantern Slides

by

Rev. T. Perkins, M.A.,
E. Marriage, F.R.P.S.,
T. Thorne Baker, F.R.P.S., F.C.S.,
C. Welborne Piper,
John A. Hodges, F.R.P.S.,
Captain Henderson,
H. Speyer,
and Others.

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Library Series. **Lantern Slides.** **No. 3.**

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The number will contain several choice examples of the fine Pictorial work of Alex. Keighley, F.R.P.S., together with numerous practical articles by eminent authorities and experts.

This number will also contain a further selection of prints sent in to the **Junior Salon.** Prints for Criticism, etc., etc.

Our **Fifth Number** will deal exhaustively with the ever-popular **P.O.P.** Printing Processes.

Intending Contributors.—An Invitation.

The Editor will be pleased to carefully consider contributions which have direct bearing on the subject announced for No. 5 of this Series.

For hints, instructions and suggestions to intending contributors, see page iii. in No. 1 of the present series.

Number 1 of the present series contains six choice examples of the pictorial work of **A. Horsley Hinton,** with descriptive essay by the Editor.

Also important and original articles on **Bromide Printing,** Toning, Border Printing, Cloud and Sky Printing, Pictorial Hints, Moonlight Effects, Double Toning, etc., etc., by John A. Hodges, C. Winthrope Somerville, F. C. Lambert, Chapman Jones, etc., etc.

At the moment of going to press a few copies of the **Fourth Edition (12th Thousand)** are available.

Those of our readers who have not already secured a copy of No. 1 are advised to do so without delay, for as soon as the few remaining copies are sold, the work will then be **Out of Print.**

Number 2 of the Present Series contains eight choice examples of the Pictorial work of Col. J. Gale, F.R.P.S., also numerous practical articles on **Bromide Enlarging** and **Enlarged Negative Making,** by T. C. Hepworth, C. Welborne Piper, C. H. Hewitt, H. W. Bennett, F. C. Burton and others. 44 illustrations and diagrams. (3rd Edition, 9th Thousand.)

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THE PRACTICAL PHOTOGRAPHER.

Library Series. No. 3.

The Pictorial Work of Will A. Cadby,

By THE EDITOR.

MR. Cadby is a typical example of a certain group of earnest workers who have, by sheer force of individuality and style of work, compelled recognition as leaders in artistic photography. Though still quite a young man, as years are counted, he is nevertheless one of the most widely known pictorial workers in his own region of study. Born in the country, he has ever retained that love of the open landscape and hedgerow flower that goes hand in hand with a ready sympathy and observant eye. Yet, curiously enough, he says he is not a great lover of written poetry; for every one of his pictures has a poetry of light and shade, of rhythm and form, which seems to tell us that there is a vein of poetry somewhere in his æsthetic constitution. This is confirmed by the modest admission that music—of the right kind—gives him great enjoyment.

It is not often that anyone is accounted much of a prophet among his own kith and kin, but in the instance under consideration there was a very near relative who, as a painter-artist, had a great and lasting influence on our photographer. It would also seem clear that some of his art impulses are inherited.

His acquaintance with the camera goes back some twelve or fifteen years. At first he was attracted to working with children as models, but latterly we

see occasional signs of variation away from the figure as a figure study, and a tendency to concentrate attention on decorative form and the expression of texture or "quality," as the painters phrase it. For long he has recognised the remarkable completeness of the camera picture, and early learned to see what only comes to many in later years, *i.e.*, that for pictorial effect one does not want this completeness. That good drawing—*i.e.*, drawing which is at once convincing and complete, is complete because it is incomplete. This is not an attempt to juggle with words or "propound a puzzle or a paradox," but simply to offer the key, or rather one of the keys, which may help the student to unlock some of the secrets of success of the pictures herewith reproduced. In a letter to the present writer Mr. Cadby says: "I want to sketch by photography. My growing feeling for years has been a wish to suppress." It is just this abstraction, this art of leaving out, of knowing what is and is not essential, with craftsmanship to seize with one's fingers what the mind grasps, that is so rare, and so valuable in photography.

The reader who, having essayed home portraiture or figures without a studio, may be encouraged by learning that Mr. Cadby's work is all done with the very simplest of apparatus, in ordinary living rooms, with certain unfavourable conditions of lighting to contend against. But the results show clearly enough that it is the man, not the tools, who does the work. Several printing methods are at his fingers ends, though carbon and platinotype come out of the race as easy first favourites.

Among the painters who, he feels, have largely influenced him are Sargeant, Shannon, Condon, Stott, and Brangwyn.

One more secret has yet to be told. Mr. Cadby has travelled far and wide, South Africa, Tasmania, New Zealand, Siam, China, Japan are all known to him. The reader who can read between the lines will hardly fail to have grasped the last-named place on the list. It is impossible not to instantly recognise in several of the compositions here reproduced the influence of that indescribable, elusive, nameless, subtle something which seems to

characterize the pictorial work of those who have lived in Japan. To the Japanese artist it seems an instinct to know exactly where to "place" his subject in the picture space—how much to leave out, and where to place some apparently unimportant thing, *e.g.*, a blade of grass, a butterfly, a bit of cloud: above all, to give to his work a decorative quality which is felt, but cannot be described.

The eight pictures chosen for reproduction have been selected with a view to showing the various phases of Mr. Cadby's style. They are annoted in their chronological order, and very fairly representative of his work during the last ten years.

Throughout the series one is at each turn impressed with the freshness of the work, the absence of conventionality and the wearisome usual thing.

"Reflections."—A happily chosen title with several shades of meaning. This well shows the early direction of Mr. Cadby's work. Note how grace of line, both of limb and of drapery, is here used with no little skill. A quiet, but not monotonous or flat, background well serves to bring out the tone values of flesh, hair, and draperies. The fillet, necket, wristlet and anklets are all well-placed bits of subtle curvature. The least satisfactory portion is the face as seen in the mirror. Throughout this picture there is a nice appreciation of texture quality.

"Butterflies."—This is one of the rare examples of photography of the nude which is entirely free from any shade of offensiveness, and well exemplifies the *decorative* use of the undraped figure. Note the artistry of placing the small patch of highlight (the butterfly) against a larger dark mass of drapery. The down-glancing face of the figure carries our attention away from the figure to this focus of light and shade. The flesh tones of the figure are skilfully rendered. The background in this instance is not so happily selected or effectively rendered as in "Reflections."

"A Poet."—This attractive work is primarily interesting, not so much as a portrait as an example of bold originality of design, which is entirely justified

in the issue. The square-shaped halo-like distribution of light behind the head, against a dark ground, diagonally placed in the frame, has a striking effect of decorative design which is considerably helped by the lines of the shoulders. The symmetrical massing of the hair is in harmonious accord with the severely geometrical style of composition.

"**Camera Sketch.**"—The beginner will say, "What a faded looking thing." The more advanced worker will say, "This is something fresh." The front-rank worker will say, "I wish I could do anything as good as this." The experienced reader will, of course, understand that a mechanical reproduction in ink cannot possibly do more than give a very rough idea of the delicacy of the original. I have already quoted one of Mr. Cadby's letters on the subject of sketching by photography. Here we have something which is perhaps as far away from "the usual thing" as photography has yet produced. It looks so easy. But, try it. It would be difficult to find a more eloquent example of the rare art of knowing exactly how much to leave out.

"**A Snow Track.**"—For the moment we leave figure work and get on to the mountain side—bringing with us the lessons already learnt, *e.g.*, simplicity of design, omission of everything not essential to the story to be told. This again is more suggestive of a crayon sketch than of the conventional photograph. The student should here carefully note the effect of the long spread-out foreground portion; how it helps to keep back the middle and extreme distance planes. The long narrow shape of the picture is helpful in the same direction, adding also to the suggestion of mountain heights.

"**Child Study.**"—A quite charming, simple, unaffected, spontaneous, child-like sketch, full of valuable hints for the student. Note the significant omission of everything not absolutely essential; the value of a quiet background space, felt rather than seen; the subdued low-toned chiaroscuro scheme; the truthful tone rendering of the face, hands, and light collar. For the moment the long

REFLECTIONS.

line made by the two legs of the sitter is a little confusing, and one could wish for a chair with not quite so many cross-bars cutting up the lower part of the composition. Nevertheless, the general effect is entirely attractive and harmonious.

"**Madeleine.**"—Contrasting this with the last-quoted picture we at once perceive suggestive points of difference. This is simpler in light and shade distribution; it has more "breadth"; the design is simpler. The chief mass of dark being near the top margin is apt to give a top-heavy effect to a composition. The posing of the hand and turn of the head are here rather more conscious than in the "Child Study"—still this will be preferred by those who put decorative effect in the first place. This has more of the impressionistic effect than the last-quoted picture.

"**Mary.**"—This reproduction is perhaps the least satisfactory of the series, inasmuch as there is an inevitable loss due to the reproduction of a large picture on a considerably smaller scale. The original picture is a fine example of skilful rendering of delicate lights and shades of flesh tones. The posing of the hand edgeways to the spectator in subdued light, and the symmetrical position of the head in the picture space should be carefully studied.

Among the many lessons which Mr. Cadby teaches us we must give a prominent place to the great principle of "leaving out" all that is not essential. The value of quiet spaces is also well told in the later rather than in the earlier works. The spontaneous and unconventional posing must not be missed. The rendering of light and shade values of face, hair, draperies is considerably nearer the truth than we are accustomed to see in ordinary photography. The placing of the figure in the picture space—or, if you prefer to call it, the trimming of the print—is again instructive in every case here given. Last, but not least, the decorative quality of *his* work shows that photography need not be the mechanical, literal, unpoetic process that it unfortunately is in so many instances.

Preliminary Notes on Lantern Slides.

By THE EDITOR.

THE photographic lantern slide is a small positive picture supported on some transparent substance such as glass or celluloid. This, placed in the optical or projection lantern, appears as an enlarged positive picture on the screen just in the same way that the enlarging lantern throws an enlarged negative image on the enlarging easel.

It is important to bear in mind that this enlarged positive picture is just as much a "*shadow* picture on the wall" as was that of the rabbit or swan made by cunning hands and fingers in our nursery days.

Strength of Shadow. Shadows of opaque objects are of equal darkness—a shadow being an absence of light—but the brighter the adjacent light parts of the picture the darker—by force of contrast—will *appear* the shadows of opaque objects. And although the greater part of a good lantern slide is neither clear glass nor opaque deposit, the same principles apply.

Size of Image.—The farther our optical lantern is from the screen the larger our picture. But as the light is spread over a larger area it is consequently of less strength. Hence our light and shade contrasts are reduced by increasing the size of the screen picture.

The operation of making a lantern slide is in many ways almost identical with that of making a bromide print, with the obvious difference of a picture on glass in one case and on paper in the other. Therefore, much of what has been said in No. 1 of the present series of *The Practical Photographer* on the subject of bromide printing will, *mutatis mutandis*, be applicable to lantern slide making, and need not in this volume be repeated.

Practical Introduction to Lantern Slide Making.

By Rev. T. PERKINS, M.A.

THE making of lantern slides by photography is one of the most useful and interesting operations open to the "Practical Photographer." It presents no difficulties which may not be surmounted by the exercise of a little patience and care.

A "Slide" compared with a Negative. A photographic lantern slide is a positive printed on a sensitive film (generally gelatine) spread on a glass plate $3\frac{1}{4}$ inches square. This film bears a general resemblance to that of a negative plate, and is developed and fixed in a similar manner, but the film is of finer grain, thinner and less sensitive, and development is not carried so far. The slight veiling of the clearer parts, often an advantage in a negative, would ruin a slide.

A Good Slide. A pleasing colour, whether black, brown, purple, or red, may be given to the metallic deposit. This is secured partly by the character of the emulsion of which the plate is made, partly by the constituents of the developer. A technically perfect slide has its highest lights clear glass, its half-tones full of detail and gradation, and its deepest shadows *nearly*, but not quite, opaque. The area of clear glass must be small, and finally the picture should be sharply defined, so as to bear considerable enlargement when projected on the screen.

Kind of Negative required. Though good slides may by modification of exposure and development be made from negatives which are not ideally the best for the purpose, yet the process is made easier if the photographer who intends to make slides bears this object in mind when exposing and developing his negative plates. The best negatives for the purpose are those that have plenty of

detail and good gradation. A hard negative is liable to produce a slide which gives a stagey, limelight-like effect on the screen.

Contact Method. In contact printing the objects are of the same size on the slide as in the negative. As the lantern plate is only $3\frac{1}{4}$ inches square and $\frac{1}{8}$-inch all round the edges is covered by the binding strips which fasten the cover-glass to the lantern plate, an area of 3 inches square is all that is available for the picture; but as a square is not a pleasing form, the subject will generally have to be included within a rectangle of 3 × 2 inches. This should be borne in mind when composing the view on the focussing screen of the camera. A rectangle 3 × 2 may be marked with a pencil on the ground glass, or a mask with an aperture of 3 inches square gummed to it, to show all that can possibly be included in the slide.

Point of Sight. Though a contact slide may be made from any part of a large negative, yet in any subject in which perspective is shown unpleasing results will be produced if the "point of sight" is not included and does not fall near the vertical line that divides the lantern slide into two equal parts.

If more of the subject than is included within an area of 3 inches square of the negative is to be printed on the lantern plate, the slide must be made by reduction.

Contact. Equally good slides may be made by either method, but each has its own advantages. For contact printing no special apparatus is wanted, and as artificial light is used slides may be made at any time; also the intensity of the light can be easily altered to suit the negative.

Reduction. Slides made by reduction require daylight, the intensity of which often varies and is difficult to estimate; a reducing camera is needed. These are disadvantages, but, on the other hand, slides may be made from negatives of any size which have not been specially taken with a view to lantern work.

BUTTERFLIES.

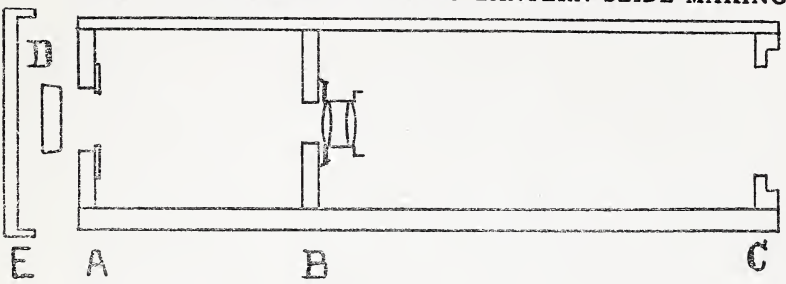

Fig. 42.

To Make a Fixed-Focus Reducing Camera.

The following dimensions are those suitable when reducing from a half-plate negative using a 5-inch lens:—Get a ¾-inch plank of well-seasoned deal 2 ft. by 8½ in., and three ½-inch boards (A, B, C) 8½ in. by 6½ in. (Fig. 42).

Cut in A a central aperture 3¼-inch square, and glue thin strips along two opposite sides of the aperture so as to form a rebate for the lantern plate.

Cut in B a central circular aperture to fit the lens flange.

Cut in C a central aperture 6 in. by 4¼ in., and on one face of C sink a margin round it ¼-inch wide to hold the negative. Use turn buttons to fasten the negative in place. Screw C to one end of the plank and at right angles to it, the counter-sunk side outwards.

The optical centre of the lens must be 15 inches from the negative and 7½ from the lantern plate. As it is not easy to determine the exact position of this point, use these measurements as a first approximation and make the final adjustment by trial, thus: Put a glass plate, on which a sheet of printed matter has been pasted, in C get someone to hold B with the lens (preferably a flat-field one) attached in the position shown in the diagram, and hold A in position with a ground-glass screen in the aperture. If the image of the whole of the plate in C is not included on the screen, shift B further from C and shift A till the image is sharp. If the image of the plate in C is not 3 inches in length, shift B nearer to C. When the position of B is found screw it to the plank, then finally adjust A

and fasten it in position. Nail stout milboard along each side and along the top from A to C, paint all the inside dead black, and paste strips of book-binders' cloth along all joints. Fit a square of wood, covered on one side with black velvet, into the aperture in A to hold the plate in place; make a cardboard cap (E) like the lid of a plate-box to cover this end of the camera and exclude all light.

To Use this Camera. Put the negative into C, a lantern plate into A, *film facing film.* Take the camera from the dark-room, the negative end covered with a cloth; turn this end towards the open sky, being careful that no trees or buildings obstruct the light. Expose by removing the cloth, then return to the dark-room and develop.

The measurements for the other-sized negatives are approximately as follows:—

$\frac{1}{4}$-plate (4×3 clear)—AB=$8\frac{3}{4}$ in,; BC=$11\frac{2}{3}$ in.

$\frac{1}{4}$-plate (8×6 clear)—AB=$6\frac{2}{3}$ in., BC=$18\frac{1}{3}$ in.

(For table of conjugate distances for other sizes, see Table, page 64.

To make an Adjustable Reducer. Get a plank about a yard long. Along each edge nail strips as shown in the Fig. 43. Make a carrier for the negative (see diagram), this will slide along the board, being held at right angles to it by the strips. Fix the camera (a back-focussing quarter-plate one with rising and falling front and swing front, by preference) to the plank by a screw passing through the hole F. Raise the camera by blocks if necessary till the lens is opposite to the centre of the carrier. Shift the carrier backwards or forwards till the image of the portion of the negative to be copied occupies the central area of 3-in. square on the focussing screen, using the rising front and swing front if necessary; focus, changing the stop if needful, till the image is sharp; cap the lens; turn the negative end to the open sky. Cover the space between the camera and negative with a cloth to exclude the light as far as possible (*absolute* exclusion is not indispensable), insert the dark slide and expose, removing the cap with the hand passed underneath the cloth. Close the dark slide and develop as usual.

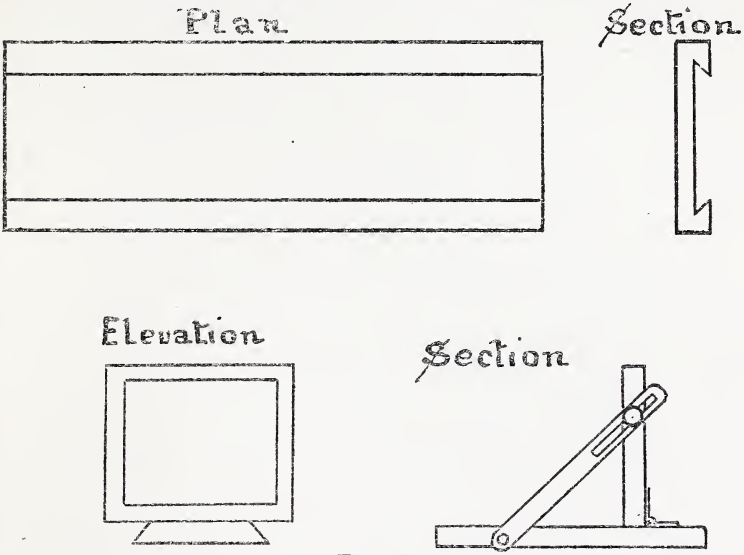

Fig. 43

Contact Printing. When making slides by contact, place the negative in an ordinary printing frame, lay the lantern plate film side downward on it, carefully adjusting it to include what is wanted, close the frame and carry it under cover to a room, darkened by drawing window blinds and curtains, in which a lamp with an opal globe is burning. Hold the frame to the light say at six inches from the globe (if at double the distance the exposure must be increased four-fold, and so on according to the law of inverse squares).

Exposure. The correct time of exposure must be learnt by practice. The following plan will help. Cover two-thirds of the plate with a card held against the frame, expose say $\frac{1}{4}$-minute, shift the card so as to uncover another third and expose for the same time, remove the card and expose again for the same time. The three strips of the plate will have received $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{1}{4}$-minute's exposure respectively. Develop and see which strip looks best. Repeat the same process

with another plate, if necessary, giving different exposures.

Similar tests may be made when reducing either by covering up portions of the negative or by pushing in the shutter of the dark slide a portion of its available distance.

Development. The formula I use is :—

A.	
Hydroquinone	¼-ounce.
Potassium metabisulphite	¼-ounce.
Potassium bromide	30 grains.
Water	10 ounces.
B.	
Caustic soda	¼-ounce.
Water	10 ounces.
C.	
Ammonium carbonate	½-ounce.
Ammonium bromide	½-ounce.
Water	10 ounces.

All these will keep well for a long time in stoppered bottles. B requires shaking before use. For use take ¼-oz. A, ¼-oz. B, ½-oz. water. This will give black tones or colours.

Warm Colours by Development. By adding some of solution C, increasing the exposure and time of development, warmer tones are obtained. When a little of C is added and exposure slightly increased the colour will be brown; if more, purple, and finally, red. Thus if the exposure for black tones is ¼-minute, ½-minute with 30 minims of C will give brown, 1½ minutes with 60 minims of C, purple, and 2 to 3 minutes with 120 minims of C, red. Black-toned slides will be sufficiently developed in 2 or 3 minutes; red toned ones may require 15 minutes. When much of C is used the colour of the deposit seen by reflected light is drab, hence the process of development can only be seen by holding the plate between the eye and the dark-room lamp.

When developing slides the dark-room light may be used much brighter than when developing negatives.

Experience alone will show how far development must be carried, but if the slightest veiling of the high-lights, as seen by reflected light appears, when

The Snow Track.

black or brown tones are aimed at, development must be stopped at once.

With a normal developer, under-exposure is shown by slowness of appearance, over-exposure by great rapidity, and by a thin flat image after fixing. No forcing of an under-exposed plate is possible; it will only lead to fog.

Tentative Development. My usual method of developing is as follows:—I aim at brown tones, but mix three solutions: No. 1, suitable for black; No. 2, for brown; No. 3, for red. I put the plate into No. 2, and if all goes well finish it in it. If the exposure has been insufficient I transfer the plate to No. 1; if more than enough to No. 3. By transferring backwards and forwards between No. 2 and No. 1, or No. 2 and No. 3, I generally get a good slide, though not always of the colour I aimed at. The same solution will serve for the development of three or four plates in succession. When sufficiently developed, the plate is well washed, and fixed in a clean solution of hyposulphite of soda. Lantern plates fix more quickly than negatives.

After fixing, swill under a tap, and wash in several changes of water for three or four hours—more will not hurt. I generally leave slides made in the evening in water all night.

Any grooved washing tank may be used, but the plates can be well washed if placed face downwards in saucers, or if four plates placed in pairs back to back are put into a 2-lb. jam pot full of water.

Dipping the slides in a very weak solution of hydrochloric acid, 1 part to 60 of water, about the middle of washing, often brightens them.

Clearing and Reducing. Slides slightly veiled or stained may be cleaned by immersion for a short time in Howard Farmer's Reducer. This reducer increases contrasts. It may also be applied locally by means of a brush or tuft of cotton wool. Some indication of cloud in a sky of uniform tone may be introduced by means of this reducer. The persulphate of ammonium reducer may be used to reduce over-developed slides, especially those in which contrasts are too strong.

Intensification. Weak slides may be intensified by bleaching with mercuric chloride, followed by a weak bath of ammonia, but as the results are not permanent and as the colour is altered this process is not to be recommended. It is better to make a fresh slide. After reducing or intensifying the slide must be well washed.

Drying. After washing, slides should be set up to dry of themselves in a place where no dust can settle on them. Drying must not be hurried by artificial heat; a current of pure dry air will soon dry a slide. On no account must the film be touched before it is dry.

Masking. When perfectly dry the slide will require a mask. Masks with apertures of various shapes and sizes may be bought. Those with rectangular corners are generally most suitable. But the cover-glass must not be put on until slide and mask are bone dry, as if any moisture is enclosed between slide and cover glass it will form a mist when evaporated by the heat of the lantern.

Binding. Place a clear cover-glass on the film side of the slide, cut the slide-binders into lengths of 3¼ inches, moisten the gummed side, lay the strip gummed side upwards on a soft tablecloth, hold the slide and cover-glass firmly together, press one edge down on the strip (this will adhere to it), turn the slide with that edge upwards so that the finger and thumb of the other hand can press the edges of the strip against the outer faces of the slide. Next bind the opposite edge, then the two others. Do not use metal binders, only paper or tape.

Spotting. Lay the bound slide on the table cover-glass upwards (the view will then be seen right as regard right and left). Stick two little spots of paper (which may be cut from postage stamp edging) at the two upper corners and a strip of the same paper along the upper edge for the title, and the slide is finished ready for use. The spotting is done to show which way the slide must be put into the lantern. See page 47.

Covers. Cover-glasses may be bought at from 4d. to 6d. a dozen, or made by cutting off with a diamond or glass cutter a strip 1 in. wide from a waste ¼-plate negative, or by clearing the film from a spoilt lantern plate. The film will generally peel off if the plate is laid for half-an-hour in a weak solution of hydrochloric acid; if it will not strip off, a stiff nail brush will easily remove it.

How to make Slides from different kinds of Negatives. If the negative is thin, print in a weak light, either by turning down the lamp or holding the printing frame further from it, or if the slide is made by reduction, by placing a sheet of ground glass or pale yellow gelatine over it. A slide showing increased contrasts may be obtained from a flat negative, even if dense, by giving a long exposure to a weak light.

If the negative is too strong in contrasts use a strong light, this will pierce the dense parts, and by over-exposing the clear shadows weaken them.

Distortion. Distortion in the negative, caused by want of verticality of the negative plate at the time of exposure, may be cured by using the adjustable reducing camera, if the upright part of the carrier instead of being fixed at right angles to the base is hinged to it, see diagram No. 43, and provided with a side strut similar to those on cameras.

Suppose the vertical lines of a building in the negative converge towards the top, place the negative upside down in the carrier, and swing the top of the carrier away from the lens, at the same time swing the back of the camera away from the lens, so that the lantern plate and negative make equal angles, in opposite directions, with the baseboard. The amount of swing must be found by trial. It is important that *both* carrier and camera back should be swung, as though parallelism of the vertical line could be secured by swinging either, the ratio of horizontal to vertical dimensions would be altered.

Barrel distortion due to the use of a single lens in taking the negative may be cured by reversing the single lens in the flange of the camera when making the reduced slide by the adjustable reducer.

(For additional information on this subject consult page 56 of *The Practical Photographer*, No. 2, Enlarging, etc.).

Choice of a Plate. There are many different firms that make lantern plates, and almost any brand will give good results. It is well to keep to one brand. It is recommended however, that when a manufacturer supplies two series, one "rapid" for black tones only, one "slow" for black or warm tones, that the latter should be chosen, and that all fancy plates made for special purposes should be avoided until thorough mastery of the making of slides on the ordinary kind has been obtained. Process plates and the very slow plates that can be developed by candle light, all useful in their way, should be reserved for subsequent work. It is well also at first to adhere to one developing agent, and not to try first one and then another of the many developers on the market, because we have seen beautiful slides made by some particular formula by other workers.

Clouds and Sky. Slides in which the sky is represented by bare glass do not look well. If there are any indications of clouds or an even-toned sky on the negative which do not show on the lantern plate with an ordinary exposure, shading the landscape part of the negative with a moving card or cloth while allowing the light to fall on the sky part will sometimes mend matters, or suitable clouds may be printed on a separate lantern plate, which when finished is used as a cover glass. Any part of the clouds that would overlap the objects on the lantern plate can be removed by a strong solution of Farmer's reducer (a few drops of a saturated solution of ferricyanide of potash added to some clear fixing solution). But skies thus added are not always satisfactory. For, except when the slides are black-toned ones, it is difficult to match the colour of the sky to the landscape, and again such skies often seem much too prominent—in the same plane with the middle distance instead of retiring to the extreme distance. See page 49.

Fig. 9.

THE MARKET BOAT.
G. Watson.

Fig. 10.

THE MAIDEN'S PRAYER.
Hilda Stevenson.

Fig. 11.

FLOWER STUDY.
W. H. Lindsay.

Introduction to Toning Lantern Slides.

By JOHN A. HODGES, F.R.P.S.

ALTHOUGH black may be regarded as the "standard" colour for a lantern slide, its pictorial qualities may sometimes be greatly enhanced by a suitable modification or selection of colour. There has long been a difference of opinion on this point, but it would seem undesirable to fetter the slide-maker in his endeavour to secure an artistic rendering of his subject by limiting him in his choice of colour.

"Colour" v. "Tone."

Photographers are prone to use the word "tone" when they intend to refer to the "colour" of a lantern slide.

Many workers, in their anxiety to secure a particular effect, are often unmindful of the fact that the process selected may be one upon which reliance should not be placed.

The novice in slide-making should certainly learn to make a good black slide before attempting the production of colour effects. It will here be assumed that the reader has succeeded in producing several black slides, the colour of which he desires to modify by the subsequent process of toning,

Permanence.

It is desired, however, to preface these hints on "toning" by recording the opinion that permanence should be regarded as a *sine qua non* in any photographic process and, if possible, the remark applies with even greater force to a lantern slide than to a print, because the conditions to which the former are subjected are far more trying to its stability than those to which the latter is ordinarily exposed. Further, our experience has demonstrated that colour, when produced by toning, is of a more fugitive character than when effected by direct development.

Gold Toning. The black produced by simple development is sometimes of a rusty or greenish hue, and in such cases a short immersion in a gold toning bath will greatly improve the colour. Some lantern plates, however, are more amenable to the action of the bath than others. The same formula and treatment may produce very dissimilar results with different brands of plates.

A stock solution of chloride of gold is prepared by dissolving the contents of a 15-grain tube of gold chloride in 15 drachms of distilled water. The toning bath is made as follows :—

Stock solution of gold	2 drachms.
Soda phosphate	30 grains.
Distilled water	1 ounce.

The time occupied in toning will vary with different makes of plates, as also will the effect produced. Sometimes the colour will quickly change to a pure engraving black, no matter how "rusty" or impure it may have been in the first instance. If the action be continued further the colour becomes purple, and, with some plates, gradually changes to a bluish purple, ultimately becoming a pure blue. There are some plates, however, that will not pass into the blue stage. Slides so treated, if properly washed at all stages, are likely to prove permanent. The above remarks apply to bromide, or bromo-chloride plates, called by the makers "cold" and "warm toned" respectively.

Chloride Plates. These tone very easily and pass quickly to the purple stage, so that the action of the bath must be carefully watched, not by looking at the slide as it lies in the dish, but by constantly examining it by transmitted light. The change of colour will be more easily observed by holding the slide in front of a piece of ground glass held up against the source of light.

For chloride plates the following toning bath is most suitable :—

Ammonium sulphocyanide	30 grains.
Stock gold solution	3 drachms.
Distilled water	1 ounce.

Very varied and sometimes beautiful colour effects may be obtained by first bleaching the slide with mercury, thoroughly washing, and then immersing in a plain aqueous solution of gold. The toning action in this case is slow, in some cases occupying hours, but the action may be accelerated by raising the temperature of the gold bath to 80° or 90°. Slides so produced, however, are liable to deteriorate with age. The gold bath is made by taking

Stock gold solution	2 drachms.
Distilled water	1 ounce.

Platinum Toning.

Slides may be treated with the following platinum toning bath in the same manner as with gold :—

Platinum chloroplatinite	2 grains.
Distilled water	1 ounce.
Nitric acid	1 minim.

But the toning action is not so satisfactory, being irregular, and with some plates proceeding with difficulty, nor can warmth of colour be readily obtained. Mr. Somerville's platinum and mercury method produces fine warm browns by reflected light, but it is difficult to carry the reaction sufficiently far to obtain the same colour effect by transmitted light, nearly all toning action being in its nature superficial or partial, and hence the variation of the results so obtained.

Uranium Toning.

Various shades of brown and red can be easily produced by toning with uranium.

No. 1,

Potassium ferricyanide	40 grains.
Acetic acid	3 drachms.
Distilled water	10 ounces.

No. 2.

Nitrate of uranium	40 grains.
Acetic acid	3 drachms.
Distilled water	5 ounces.

The slides to be toned by this process, or indeed by any other, must be thoroughly washed to remove every trace of hypo, or reduction instead of toning will result. The above solutions should be mixed

in equal parts just prior to use. When the desired colour is obtained the slide must be washed in frequent changes of water slightly acidulated until the yellow tinge in its clear portions is removed. Prolonged washing will discharge the colour and leave the slide in its original condition, the colour being readily soluble in an alkaline solution. (N.B.—Most tap water is slightly alkaline).

Blues and Greens. Green and blue may be easily produced by first toning the black image to a brown by the foregoing uranium method, washing until the yellow stain is discharged, and then immersing the slide in the following :—

Perchloride of iron (B.P.)	10 minims.
Distilled water	1 ounce.

The colour will slowly change, first to a yellowish and then to a bluish green, and, if the action be continued, to greenish blue, and ultimately to a bright Prussian blue, the colour of the latter being made deeper by immersion in the following acid bath :—

Sulphuric acid	10 minims.
Water	1 ounce.

subsequently washing till the blue tinge in the lights is eliminated. The slides should not be washed in running water, nor should the washing be very prolonged, as the blue deposit, like the brown, is soluble in water. As the uranium bath has an intensifying action, and confers density on the slide, care must be taken in development to keep the slides thin.

Mercury Toning. Many very beautiful shades of brown, red and purple are obtainable by first bleaching with mercury and then applying a reducing agent. For instance, ammonia or sulphite of soda gives fine purples and blacks, lime water or sulphide of soda beautiful browns.

Warm Tones by Development. Warm tones produced by development give by far the most satisfactory results as regards permanence. The reason being that the colour of the image is due to the condition in which it is

deposited by the developer, whereas in most cases when the colour is produced by toning, the chemical reaction is more or less superficial, and therefore incomplete and liable to future change.

The conditions which tend to warmth of colour by direct development are generous exposure, greatly in excess of that required to produce black coloured slides, followed by slow, or tentative, development with a weak and highly restrained developer. The longer the exposure the greater the warmth of colour, but to produce it the developer must be diluted and further restrained, and a longer time allowed for development. Any attempt to curtail the period of development by the addition of accelerator will defeat the object aimed at, and cool the ultimate colour of the slide.

Pyro Development. Pyro is a suitable developer for the production of warm-coloured lantern slides. The following formula is reliable :—

No. 1.

Pyro	40 grains.
Sulphite of soda	200 ,,
Citric acid	20 ,,
Bromide of potassium	30 ,,
Distilled water	20 ounces.

No. 2.

Carbonate of ammonia	60 grains.
Sulphite of soda	100 ,,
Ammonia ·880	1 drachm.
Distilled water	20 ounces.

For use, mix in equal parts just before use. It is unnecessary to dwell on the technical details of exposure and development, commercial plates varying so much in speed and other characteristics, but using the developer in the manner indicated a normal exposure should yield a slide of a good sepia brown. If greater warmth is desired the exposure must be increased, and the composition of the developer modified by adding one part of No. 2 solution to two parts of No. 1, and diluting the mixed developer by adding water equal to its bulk.

Developing Chloride Plates.

The warmest shades of colour, *i.e.*, yellows, claret colour and bright red, are most easily obtained on chloride plates developed with the following developer :—

No. 1.

Citric acid	130 grains.
Carbonate of ammonium	50 grains.
Distilled water	1 ounce.

No. 2.

Sulphate of iron	120 grains.
Sulphuric acid (pure)	2 minims.
Distilled water	1 ounce.

Give the plate a full exposure. Add one part of No. 2 to three parts of No. 1 just before use.

Molybdenum Toning Process for Lantern Slides.

By Rev. F. C. LAMBERT, M.A.

THE use of molybdenum as a toning agent seems to be but very little known. The results obtained by a few recent experiments are so very promising that attention is invited to the subject.

Toning Bath.

Water	2 oz.
Acetic acid	2 drms.
Ammonium molybdate	10 gr.
Potassium ferricyanide	4 gr.

The action of this bath is somewhat slow. Its first effect is to change a black deposit into a warm brownish black, then to a cool brown, which passes into a warm brown, and finally to a tint between burnt sienna and vandyke brown. The colours, though similar to those obtained by the uranium bath, are yet agreeably different, being less "foxy" red and more umber-like in general character. During toning the slide becomes yellow-stained, but this may be removed by washing in very dilute acetic acid. The usual alkaline tap water slowly removes the "tone" or colour. Figs. 12-13-14 may give some idea of one of the colours obtained by this process.

Fig. 12. WOLFORD MANOR. A. E. Burnett.

Fig. 13. AN OLD BACHELOR. W. Pickering.

Fig. 14. WINDSWEPT. G. H. Haycox.

(Molybdenum Toning, p. 22).

Some Methods of Toning Lantern Slides.

By C. WELBORNE PIPER.

THE following toning methods are all applicable to slides that have been fully developed and fixed. Methods 1 to 8 are specially suited to dense images, and methods 9 to 12 to weak ones, hence it is often possible to produce a good result from a slide that would otherwise be useless by reason of erroneous exposure or development. When several exposures are made from one negative in the endeavour to produce by development alone the best possible result, most, if not all, of the rejected slides should be capable of conversion into good toned slides. The exact tone obtained varies with the brand of the plate, the tones described being those produced on Thomas's plates.

For Dense Images.

Chloride Toning (Reds and Red-browns).—No. 1. Suitable for a slide of full but not excessive density.

Bleach the image thoroughly in:—

Potassium bichromate	10 grs.	or	20 gms.
Sodium chloride (table salt)	5 ,,	,,	10 ,,
Hydrochloric acid (about)	5 mins.	,,	10 cc.
Water	1 oz.	,,	1000 cc.

Add the acid tentatively, only using enough to make the solution act readily. After bleaching rinse, soak in 5 % potassium metabisulphite until yellow stain is removed, and then wash well, dry, and expose to sunlight until the image is a red colour. The red is obtained more easily if the slide is exposed as soon as dry; if kept away from sunlight for some time the image loses sensitiveness and it will then only assume a brown tone when sunned.

The result must be kept dry and the tone is then practically permanent, the only effect of time being a slight softening of the tone. The sunning process makes the image insensitive to the feeble light of the lantern and no further change due to light need be feared.

The result may be both intensified and made browner by treatment with copper bromide or mercury bromide followed by washing and exposure to light. (See methods 4 and 10.)

A peculiarity of this chloride process, and of the following processes up to No. 7, is the great transparency given to the shadows.

No. 2.—Suitable only for a very dense slide, with slight fog.

Bleach in a 5% solution of ferric chloride. Wash, first in water acidulated with sulphuric acid to remove yellow stain, and then in plain water. Dry, and expose until a bright red tone is obtained. The exact tone will vary with the quality of the slide, which must be very dense to give a good red.

Iodide Toning (Browns).—No. 3.—Most suitable with very dense slides.

Bleach in chloride solution and wash very thoroughly as in No. 1 method, then soak in 5% potassium iodide until image is yellow throughout. Wash again and dry. Exposure has hardly any visible effect and may be omitted. In the lantern the tone is a soft brown, and the result is very permanent.

No. 4.—Suitable for an over, but not excessively dense slide. Bleach in :—

Copper sulphate	24 grs.	or	50 gms.
Potassium bromide	24 ,.	,,	50 ,,
Water to	1 oz.	,,	1000 cc.

Wash well and then soak in 5% potassium iodide for five minutes, wash again, dry and expose. The result is a very pleasing soft brown (umber) and very permanent. The colour is similar to that obtained by the mercury methods to be described (Nos. 9 and 10), but these methods are only applicable with weak slides, while this one requires a dense slide.

Bromide Toning (Grey and Brown).—No. 5.—Suitable for slightly over-dense slides.

Bleach in chloride solution and wash as in No. 1 method, then soak in 10% potassium bromide, wash again, dry, and expose until the image is grey.

This may be regarded as a method of reducing an over-dense slide by the process of turning the black deposit into a transparent grey one. The grey is a good one with just a trace of warmth.

No. 6.—Suitable for a slide slightly less dense than the preceding one.

Bleach in copper bromide solution as in No. 1 method, wash, dry, and expose until image is grey. The result is similar to that of No. 5 method but the tone is darker.

No. 7.—Suitable only for very dense slides.

Bleach in 5% ferric chloride solution, clear and wash as in No. 2 method. Follow with a soaking in 10% potassium bromide for five minutes, wash, dry, and expose until the image is a grey-brown, or a near approach to a true sepia.

Copper Toning (Red).—No. 8.—Suitable only for a very dense slide.

Bleach in 5% potassium ferricyanide, wash very thoroughly, and preferably, dry the film. Then soak in copper bromide solution (or in copper chloride) until a red tone is obtained. Wash again and dry. The result is very similar to the red given by the uranium method (No. 12) but somewhat softer. It is different from that of Ferguson's copper toning bath and requires a much denser image.

For Weak Images.

Mercury Toning (Browns).—No. 9.—Suitable for slides of slightly under normal density.

Bleach in 5% mercury chloride solution to which a few drops of hydrochloric acid have been added. When washed, dried and exposed, the result is a very good soft brown. Exposure has so little visible effect that it may be omitted.

If this bleached image is treated with ammonia, soda sulphite, or hypo, a deep purple brown is obtained, and the result seems to be much more permanent than in the case of negatives that have been intensified by similar methods.

No. 10.—Suitable for slides well under normal density.

Bleach in 5% mercury chloride solution in which 5% of potassium bromide has been dissolved. Wash, dry and expose. The result is a slightly deeper brown than that given by mercury chloride. Exposure is necessary to bring out the difference between the two tones.

This image becomes a transparent purple brown if treated with hypo, but it is not much affected by ammonia or soda sulphite, and the small effect that is produced is not permanent. If in either of these two mercury methods the shadows become too dense and clogged, then hypo is the best remedy.

No. 11.—Suitable only for a very weak image quite free from fog.

To one ounce of 5% mercury chloride solution add slowly and with continual stirring, a 10% solution of potassium iodide until the orange precipitate first formed is just dissolved and the solution is quite clear, then dilute with water to make two ounces. Soak the plate in this solution until the image is brown, then wash in changes of still water until the brown changes to a bright orange. Rinse gently and dry. Running water if used will produce stains that are difficult to remove. The result, seen in the lantern, is a very glowing warm brown of great luminosity. See Figs. 9-10-11.

Uranium Toning (Red).—No. 12.—Suitable for slides of (or just under) normal density.

Tone the image very thoroughly in :—

Uranium nitrate	1 gr. or 2 gms,
Potassium ferricyanide	1 ,, ,, 2 ,,
Acetic acid	1 dr. ,, 120 cc.
Water to	1 oz. ,, 1000 cc.

Tone until the image is as red as it will become on both sides, then soak in a 1% solution of ammonium sulphocyanide until all yellow stain disappears. Add 2 grs. of potassium ferricyanide to every ounce of the sulphocyanide solution and again soak slide until the image is a bright red. Wash gently and dry. This red tone is fairly permanent and is not liable to any deterioration that will materially affect the tone of the projected image.

Fig. 15. J. A. Pitchforth.

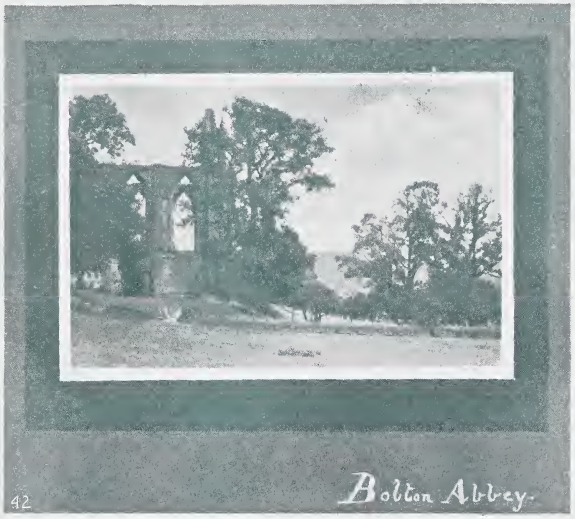

Fig. 16. J. Harbottle.

WINTER STILLNESS.

(Tone Colour Process No. 24, p. 31).

Toning Lantern Slides.

By ERNEST MARRIAGE, F.R.P.S.

AT the outset it will be well to state that most of the experiments, the results of which are detailed below, were made upon slides which were brown in colour. Slow lantern plates but no chloride plates were used. It is important that the slides be thoroughly washed, and it has been my invariable practice to harden the gelatine in a bath of formaldehyde (40% commercial solution 1 part, water 8 parts), for five minutes, after which the slide is rinsed and dried before toning.

Toning by a Single Solution.—Some reducers affect the colour of a slide—the Howard-Farmer reducer and ammonium persulphate—the action is probably due to sulphur toning.

Ammonium Sulphide. 1.—P. B. solution 1 dram, water to 1 oz. The simplest and nastiest toning solution; all operations should be carried on out of doors. The first alteration in colour is in the direction of blue; a brown slide turns blue black, but longer soaking changes the image to brown. Very little alteration in density. Perhaps very slight increase. The colours obtainable are good, but in no case warm.

Schlippe's Salt. 2.—Though antimony in some form is presumably deposited, the action is chiefly a sulphur toning.

Sulphantimoniate of Potash	15 grains.
Ammonia	1 or 2 drops.
Water to	1 oz.

The colour of the toned wet slide is misleading. It appears a warm brown with increased density, but when dry the colour is a bluish slate, very similar to what is produced by a weak bath of ammonia sulphide.

Ferguson's Copper Solution. 3.—The bath is made up as follows from three 10% solutions: sulphate of copper 75 parts, neutral potassium citrate 570 parts, are mixed, then 66 parts of potassium ferridcyanide are added. The opacity of the slide is not altered but the colour of the deposit is

changed to a distinct red, whilst browns of various tints are obtainable if the toning is stopped at earlier stages.

Iron Process for Blue. 4.

1 ounce 1% solution ammonio-citrate of iron.
1 ,, 1% ,, potassium ferridcyanide.
95 minims glacial acetic acid.

The solution is a deep blue colour and can be used over and over again. After standing some time it will separate, but this does not affect its action. Before using shake the bottle. The slide tones rapidly in this bath to a full blue; the colour is rather crude. For most subjects it is best to leave a trace of the original silver image unaltered, in the case of a brown slide this plan gives a greenish tint. The subsequent application of an alkali alters the colour of a slide toned in this bath, ammonia gives a blue black, whilst soda carbonate produces a brown and at the same time reduces density. To preserve the tint the slide must be varnished as soon as dry in the case of ammonia.

Ammonio-Citrates of other Metals. 5.—Solutions of copper, cobalt and manganese can be made up in a similar form to No. 3. My results, though interesting, were of no practical value except with the first-mentioned metal.

Gold. 6.

Ammonium sulphocyanide.....	10 grains.
Chloride of Gold	1 ,,
Water to.....	8 ounces.

The colour of a brown slide turns towards blue black with slight gain in density. By pushing the process to its limits a blue colour is reached which is suitable for frost and snow effects or seascapes.

Platinum. 7.—An acidified solution of potassium chloroplatinite has no apparent effect on a slide. I tried potassium chloroplatinite 2 grains, hydrochloric acid 30 minims, water to 1 oz. The addition of a trace of chloride of copper bleached the slide. Mr. Somerville's platinum toning solution changes the slide to a warm brown. The formula is

Potassium chloroplatinite	2 grains.
Mercury bichloride	1 ,,
Citric acid	9 ,,
Water to.....	1 ounce.

Bromide of potassium was omitted and hydrochloric acid 30 minims took the place of the citrie acid in my experiments. The opacity of the slide is increased. If after washing a developer is applied, the colour is changed to a strong purple black with considerable increase in density. See Fig. 19.

Other Toning Solutions. 8.—Chlorides of other metals may be used to tone slides. Copper, iron, mercury and nickel in dilute solutions turn the colour of a brown slide towards blue. Any solution which, when sufficiently strong, will convert the metallic image to a salt, forms a toning bath giving blue tones, but a weak solution must be used, otherwise the action is too rapid and the slide is bleached. I may instance in this connection iodine, potassium ferridcyanide, and the acid bichromate of potash given below. In every case considerable reduction in density takes place, and the blue colour obtainable is not pronounced. Formulæ 4 and 6 are to be preferred.

Bleaching Methods. 9.

Potassium bichromate	5 grains.
Hydrochloric acid	10 minims.
Water to	1 ounce.

Wash the bleached slide until the yellow stain is removed.

10.

Potassium iodide	40 grains.
Iodine	4 ,,
Water to	1 ounce.

Wash the slide to clear the stain. The image is converted into silver iodide, yellow by reflected, brown by transmitted light and increased in opacity. A solution of iodine in methylated spirit has precisely the same effect. Light does not alter the appearance of the image, nor does an ordinary developer.

11.

Copper chloride	44 grains.
Hydrochloric acid	10 minims.
Water to	1 ounce.

12.

Ferric chloride (P.B.)	15 minims.
Hydrochloric acid	15 ,,
Water to	1 ounce.

13.

Bichloride of mercury	¼ ounce.
Hydrochloric acid	15 minims.
Water to	5 ounces.

14. Chloride of nickel ..... 44 grains.
Hydrochloric acid ..... 10 minims.
Water to ..... 1 ounce.

The action of all these metallic chlorides (11 to 14) is very similar at the outset, the image being converted into a white deposit. The slide should then be thoroughly washed. In the case of 12 a rinse in dilute hydrochloric acid (1 part, 60 parts water) is necessary. It is also desirable with 13. The mercury bleached image is not affected by exposure, but is of increased density, and warm brown by transmitted light. The other three formulæ give deposits of chloride of silver which darkens on exposure. The colour after full exposure to sunlight generally inclines towards pink, or in a strong slide to violet and purple; 14 gives a more purple tint than the other two. Baths 11, 12 and 14 reduce density; the amount of foreign metal deposited in the image being probably minute, the alteration in colour is chiefly due to the conversion of silver to silver chloride, and of a developed to a printed-out image. Chlorides of cobalt, manganese, tin and zinc are inert.

Potassium Ferridcyanide. 15.—The exact strength is immaterial. I generally use a saturated solution. When the slide is thoroughly bleached, which can be judged by the appearance of the image through the glass, it is washed until the yellow stain is removed. The image is a creamy white and density is diminished, the slide is only useful in so far as the colour may be altered by chemical means, exposure to light and application of developers produce no change.

Treatment of Bleached Slides, made by 15.

16. Chloride of cobalt ..... 44 grains.
Hydrochloric acid ..... 10 minims.
Water to ..... 1 ounce.

A greenish deposit in the image. After sunning, the general effect is brown. The results are unattractive.

17. Copper bath, 11. No appreciable alteration until the slide is sunned, then good pink tones. Density reduced.

18. Iron bath, 12. Slide rinsed with acidified water. The slide is changed directly to greenish-blue, identical result to 4.

19 Iron protosulphate, a 5% solution.

Gives fine purple black colour immediately. The image viewed by reflected light has a blue appearance, similar to 4. It seems probable that iron is deposited, whilst the silver is reduced to the metallic state. The high-lights keep clear, and the process gives great increase of density. Rinse in a weak acid bath and then wash.

20.

Manganese chloride	44 grains.
Hydrochloric acid	10 minims.
Water to	1 ounce.

Not much alteration in appearance but increased density. After sunning, the image is slightly tinted pink, but the general appearance is white and opaque, as with 13. Not a useful process.

21.—Mercury bath 13. A white deposit is added, on sunning the colour of the slide changes to brown.

22.—Nickel bath 14. Results very similar to copper (17) colour, slightly bluer. Experiments with chlorides of other metals failed to produce results, though in the case of zinc possibly there was gain in density, but as subsequent sunning failed to produce any indication of pink in the deposit, it is more probably inert.

Bleaching by any Process, then treating with:—

23.—Schlippe's salt, bath 2. The resulting colours are very warm yellow browns accompanied by increased density. Bleaching with mercury (13) gives the greatest strength. Potassium ferricyanide (15) approaches an orange tint. Iodine (10) is a satisfactory method.

24.—A dull green tint can be obtained by partly bleaching in 15, treating 23, then, after washing, toning in 4. See Figs. 15-16.

Ammonium Sulphide. 25.—Slides toned by this process are affected by solutions of metallic chlorides, but the value of such methods is very doubtful. Ammonium sulphide following iodine 10 gives good brown tones.

Iodine. 26.—Slides bleached with mercury 13, may be treated with iodine 10, and then washed. The result is very similar to 10, the image, though denser, is nearly of the same yellow tint. I have not been able to convert the yellow mercuric iodide in the gelatine film to the scarlet form.

The permanency of the slide is probably as great after treatment in 1, 10, 19, 23 and 26 as in its original state. Iodine and Schlippe's salt, either separately or in conjunction, produce crude tints. The most useful colours are obtained with 1, 3, 4, 6, 7, 17, 18, 19 and 22. Slides prepared four years ago by nearly all the processes herein given (7, 18, 19, 21 and 24 are the only exceptions) show no deterioration.

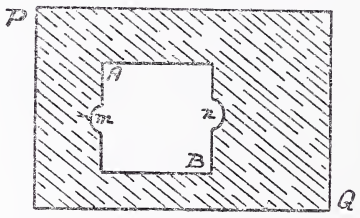

Fig. 44.

Contact Printing from Large Negatives.

Having selected the position of the lantern plate on the large negative, cut a piece of card, same *thickness* as a lantern plate and same *size* as the large negative (Fig. 44, P, Q). In this cut out an opening (A, B) $3\frac{1}{4} \times 3\frac{1}{4}$ (or a trifle larger) in the selected position of the required picture. In the centres of opposite sides of this opening cut out small semi-circular portions (*m*, *n*). The card is laid on the negative in the frame and the lantern plate put in the opening (A, B). The two small spaces (*m*, *n*) enable us to remove the plate without disturbing P, Q or scratching the surface of our large negative. This card arrangement prevents any shifting of the plate when the back of the printing frame is being closed, and enables us to repeat the same position if desired. Observe that by turning this card about we get a choice of four different positions.

Fig. 17. Mrs. W. R. Kent

A COTTAGER OF AXMOUTH.

(Hydrokinone Development Colour, pp. 34-35).

Toning Lantern Slides.

By T. THORNE BAKER, F.R.P.S., F.C.S.

THERE is a considerable difference between theoretical and practical toning, where lantern slides are concerned; many baths which have been found to work excellently with some photographers will not work at all in the hands of others, and one seems at a loss to be able to account for this. But in lantern slide making it must always be borne in mind that there are many different kinds of lantern plates, and that we must consider which kind of tone we want ultimately before selecting the plate.

Kinds of Lantern Plates. Broadly speaking, there are three kinds of lantern plate in common practice, the pure bromide, the chloro-bromide, and the pure chloride. Neither one will behave like another with certain baths, and therefore one particular plate should be chosen according to the tones it is desired to produce later on. For black tones, by direct development, we must of course have the bromide plate, whilst if red tones are to be obtained by means of modified development, either a chloro-bromide or a chloride plate must be chosen—preferably the latter.

Methods of Toning. There are two distinct ways of altering the tone of a lantern slide; it may be developed out with a coloured image, when a permanent result is obtained, or it may be developed out black in the ordinary manner, and the image converted into one composed of an altered chemical compound with, of course, an altered colour. One cannot help feeling some surprise that so little advantage is taken of the first method. By slightly over-exposing a chloride or chloro-bromide plate, and using a suitable solution for its development, it is possible to obtain red, yellow, mauve, sepia and brown tones; these may be *toned* by means of a gold bath, and a

bright blue result produced. As far as chemistry can tell us, all such results are unalterable, especially as the film is generally protected from atmospheric influences by the cover glass. The production of these coloured images is a purely physical process; it is difficult to explain how the silver image can be obtained in such a variety of tints, but probably only partial reduction of the original salts takes place. It is certain, however, that if the image be slightly warm instead of black, it is readily amenable to treatment with a gold bath, and thus we have a still further variety of colours at our disposal.

Despite the straightforward nature of the operations, the certainty with which they may be carried out, and the inexpensive nature of this process, the majority of workers prefer to get a good black-tone slide, and alter it to a brown, green or blue by means of the copper, uranium or iron baths. We shall therefore describe those methods of toning with uranium, etc., which are particularly applicable to lantern plates, but shall first devote some little attention to the direct method above referred to.

It need hardly be said that a special form of developer is first of all desirable; and we shall assume that chloride lantern plates are to be used. (There is no difficulty in obtaining these, as several makers, both in this country and on the continent, manufacture large quantities of them).

Development Method.

Where several slides are to be made, and time is not an object, the easiest way to obtain bright red tones is by slight over-exposure and very weak development with hydroquinone and caustic soda. A good developer for dilution in this way will be found as follows:—

A.	Hydroquinone	15 grs.	or 1 gm.
	Pot. metabisulphite	15 ,,	or 1 ,,
	Pot. bromide	3 ,,	or 2 ,,
	Water	4 oz.	or 120 cc.
B.	Caustic soda	20 grs.	or 1·3 gm.
	Water	4 oz.	or 120 cc.

Ten per cent. bromide solution is also necessary, as it is desirable to vary the quantity of restrainer

to produce the differences of tone. The exposure should be given to daylight, and may vary from twice to twenty times the normal, more bromide being added to the developer as exposure is increased. As a typical example we might take the following. Fifty seconds' exposure is given to a plate under a medium negative to diffused daylight (*i.e.*, not direct sunlight). One ounce each of A and B are mixed together, and ten ounces of water and a few drops of bromide solution added. In very weak gaslight the development may now be carried out, but as it will take perhaps twenty minutes or longer, it is as well to do several at once. Figs. 17 and 18.

A few trials will enable one to find out to what extent exposure must be increased, and the developer diluted in order to give a desired colour, and if several slides are wanted all of one tint, identical results will be obtained by giving the same time for exposure and development. Half a dozen plates may be placed in a $10'' \times 8''$ dish, and covered with developer, and left to develop up at leisure, being examined perhaps every five or ten minutes.

Such is the easiest and most direct way of producing warm tones. But the length of time necessary is frequently a drawback, and when speed is a weighty matter we must make use of some other method. There are two other developers eminently fitted for giving warm tones, and these are ferrous citrate and edinol. The makers recommend a formula containing edinol, with a quantity of bisulphite, and a minimum of alkali, but in practice we have found the developer below to be of more general utility.

Edinol	15 grs.	or 1 gm.
Acetone sulphite	75 ,,	or 5 ,,
Amm. carbonate	15 ,,	or 1 ,,
Ammonia (·880)	15 mins.	or 1 cc.

The quantity of ammonia has to be altered according to the tone that one wants, as it regulates the speed of development, and the speed in its turn governs the tone or colour of the image.

For developing over-exposed plates to a warm red or yellow colour, the following iron formula will be found an excellent one.

A.	Citric acid	= parts.	or	20 gms.
	Amm. carbonate.....	,,	or	10 ,,
	Water	,,	or	30 cc.
B.	Ferrous sulphate.....	= parts.	or	5 gms.
	Sulphuric acid			.5 cc.
	Water	,,	or	18 cc.
C.	Common salt.....	= parts.	or	18 gms.
	Water	,,	or	100 cc.

No definite instructions can be given as regards exposure, but the amount of over-exposure necessary to give the desired colour can readily be ascertained by an experiment or two. Three parts of A are mixed with one part of B, and a drop or two of C added. The tone becomes more red according to the amount of C added. It will be found far more expeditious to use daylight for the exposure of chloride plates—to which the above developer is particularly applicable—as with gaslight such a long time is often necessary.

It is a singular thing that, provided the image obtained by development be at all warm in colour, it may be toned by a gold bath; a red slide, if placed in the combined toning and fixing bath instead of ordinary hypo, will assume a chocolate tint during fixation. But beautiful deep blue and violet colours may be got by toning a red or warm black slide, after it has been fixed and *thoroughly* washed, in some such bath as the following :—

Amm. sulpho-cyanide	30 grs.	or	2 gms.
Water	10 oz.	or	300 cc.
Gold chloride.....	2 grs.	or	·14 gms.

A short washing after being toned is sufficient to make the slides permanent.

A good iron formula for chloride plates has been given by Pizzighelli recently, as follows :—

A.	Citric acid.....	30 parts	} Filter this solution.
	Water.....	70 ,,	
	Ammonia (·880)	15 ,,	
B.	Ferrous sulphate		10 parts.
	Water		30 ,,
C.	Salt.....		1 part.
	Water		30 parts.

For rich red tones use A, 15 parts; B, 5 parts; C, 1 part.

Fig. 18. W. H. Witts.

MONTHLY CRITICISM. PRIZE PICTURE.

(Hydrokinone Development Colour. *Vide* **p. 34-35****).**

Toning Baths. We shall assume next that a black image has been obtained in the ordinary way upon either a bromide or chloride lantern plate, and that it is desired to convert it into a coloured picture. This must be done by causing a deposition of some metal upon the reduced silver of the image, or by converting it into a compound substance by means of some metallic salt. There are four chief colours which may be imparted to the black slide, though a large number of tints may be obtained which we class under one or other of these heads.

RED, including orange, red, sepia, etc.
BLUE, „ bright blue, dark blue, greenish blue.
GREEN, „ bluish-green, dark green.
GREENISH-BLACKS. to be generally avoided.

Some of the latter tints are very suitable for certain subjects, but they are extremely uncertain as regards their production.

Copper baths we shall leave alone, and describe only the uranium methods, with which we have had many years' experience. Two solutions are all that is necessary, and they are made up as follows :—

A.	Uranium nitrate	30 grs. or	2 gms.
	Potassium ferricyanide ...	25 „ or	1·7 „
	Acetic acid		5 drops.
	Water	6 oz. or	180 cc.

First dissolve the uranium, then add the other chemicals; shake well from time to time, keep for a week, and filter. The filtered solution keeps indefinitely in the dark, or in a deep orange bottle.

B.	Ferric-chloride.....	15 grs. or	1 gm.
	Water.....	3½ oz. or	100 cc.

The one thing essential to success is to use a thoroughly well-washed black-tone lantern slide, and in order to make sure that all the hypo is removed, we have found a short soaking in Iodosal solution very effective.

A gives all red tones, according to length of immersion. When of the desired colour, the slide must be placed in a 2 % solution of ammonium sulphocyanide until the whites are clear, and then well washed.

If now placed in B for a few moments, rinsed and dried, a green tone will be obtained. Longer immersion produces green-black tones, and finally blue. If a bright blue colour be desired, it is only necessary to rinse a slide when toned with B after A in very diluted nitric acid.

There we have the whole method in a nutshell, so to speak; columns of writing are quite useless, as a few simple experiments will show the reader what a variety of colours can be obtained when the operations are carefully carried out with the baths given.

It must be remembered when making green or blue slides, by using the B solution after treatment with A, that in drying, the colour becomes much "bluer," hence for a greenish-blue tone we must wash and dry the plate some time before it has reached the particular shade we desire to have in the finished picture.

Bleaching Methods. Less direct ways of producing coloured slides are also very successful, as was clearly proved recently by M. Molteni, who has obtained some interesting results. An ordinary black lantern slide may be bleached in the following bath:—

Water	4 oz.	or	100 cc.
Mercuric chloride	1 dr.	or	4 gms.
Hydrochloric acid	15 mins.	or	1 cc.

After a good washing, the bleached slide is exposed to daylight for a few minutes, and then placed in a ten per cent. hypo bath, when the image will reappear, of a yellowish-brown colour. Such tones are quite permanent as far as can be at present gathered.

Another bath for bleaching the slides previous to the daylight exposure is this:

Water	4 oz.	or	100 cc.
Salt	45 grs.	or	3 gms.
Copper chloride	15 ,,	or	1 ,,

When the image is bleached, the plate is well washed, and then exposed to daylight. This produces a bluish-violet picture.

Explanation. The explanation is simple enough. When the black lantern slide is placed in either of the above baths, the silver image

is converted into a white silver *chloride* image. On exposure to daylight, then, this chloride darkens in the ordinary way to the colour which silver chloride assumes when acted upon by light. If only feebly darkened, the image may be brought up to any strength by a weak developer, and of course no fixing is necessary.

Cover Glasses from Old Negatives.—Cover glasses of good quality thin glass are about half the price of dry plates. They may easily be made from defective quarter-plate negatives by cleaning off the film and cutting a strip just one inch wide from one end, thus reducing the quarter-plate $4\frac{1}{4} \times 3\frac{1}{4}$ to lantern size $3\frac{1}{4} \times 3\frac{1}{4}$.

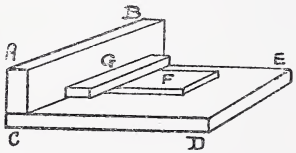

Fig. 45.

Procure a flat bit of (cigar-box) wood about 6×4 inches (C, D, E, Fig. 45). Along one end screw a narrow strip (A, C, B) at right angles to the flat part (C, D, E). Carefully plane a strip (G) so that its two sides are exactly parallel and about $4\frac{1}{2}$ inches long and a little less than an inch wide. The exact size must be found by trial. A quarter-plate (F) is laid on the board (C, D, E) and one end pushed up close to A, B, the cutting guide (G) laid on the glass and close to A, B. The cutting diamond passes along the edge of G. The width of G must be such that the part cut away is exactly one inch wide.

A Chat with Henry Speyer.

By THE EDITOR.

TO see half a dozen of Mr. Speyer's slides properly displayed on the screen is to see an example of the best class of lantern slide work of to-day. It is an object lesson in the combined results of deft fingers, skilful craftmanship, a keenly discriminative eye and fruitful patience. Unquestionably Mr. Speyer stands in the front rank of lantern slide makers. I am glad to place on record my sincere thanks to him for the ready way in which he placed his sound and valuable knowledge at my disposal when seeking a chat with him on behalf of my readers.

He said one of his great difficulties was in getting fine quality plates. Tiny faults almost too small to be seen when the slide is in the hand show up on the screen as serious defects. These defects, *e.g.*, pinholes, dust grains, scratches in the glass, etc., etc., at once dispel the illusion and tell us that we are looking at a lantern picture. As to developers, Metol is used for slides from very strong contrast negatives, but it does not readily give sufficient density. The Barnet formula is a favourite one. For most negatives, Quinol is valuable, though it tends sometimes to give granular results. All things considered, perhaps Amidol is first favourite. As to toning, the gold and sulphocyanide bath is used, also the Hypo alum process. A stale bath of the latter is preferred. A very slight reduction in the Hypo and Ferricyanide bath is of general service and brightens up a slide in a very useful manner. The very highest lights may be clear glass. To filter the developer is a small precaution quite worth the trouble entailed.

After fixing and washing the slide should be passed through a very dilute solution of hydrochloric acid to remove any traces of lime due to the water supply. Then the gelatine should be hardened and rendered insoluble by 5 minutes

Fig. 19

Miss M. E. Bruce

WHAT'S HAPPENING?

MONTHLY CRITICISM. PRIZE PICTURE.

(Tone Colour by Process No. 7, p. 28).

immersion in a 3 or 4 per cent. solution of Formalin. After this another ten minutes' washing is required. Finally, it is drained for a moment or two and then goes into a bath of alcohol to abstract the moisture and hasten drying. To prevent dust settling on the plate while it is drying, it is placed in a large cage-like structure surrounded by thin fine gauze. One of Mr. Speyer's needs is a thoroughly satisfactory method of toning to a pleasing brown colour. He is of opinion that the warm colours obtained by prolonged exposure and ammonium carbonate in the developer are not permanent.

Finally, he advises slides being stored in a thoroughly warm and dry place, when there will be little chance of their suffering damage in the lantern* (figs. 20 and 21).

System.—When about to make a lot of slides, it is desirable to sort out all the negatives into three classes, viz., strong, medium and weak contrast, and to finish one lot before beginning the next; because by dealing with them in groups, each exposure is a help in estimating that required for the next in the same group of negatives.

The coated side of a lantern plate is to the beginner not very easy to distinguish. The emulsion is not so opaque or visible as in the case of an ordinary plate. But if the plate is held so that the eye catches the reflected glint of the dark-room lamp, first from the glass side and then from the coated side, it will be seen that the reflected image is sharper and brighter from the glass side than the coated side. The glass side of the plate may be distinguished from the film side by breathing on both sides when the glass side is dulled by the breath, which the film side shows no change. Again, if doubt remains, then make a tiny pin point scratch in one corner of the slide, when feel and sight will show the coated side. Remember also that the plates are sent out packed film to film.

*Fig. 20.—The Matterhorn (14,705 ft.) from the Hoernli. Fig. 21.—On the Dreieckhorn Glacier (11,000 ft.).

Exposure and Development.

Rev. F. C. LAMBERT, M.A.

GIVEN a suitable negative, the foundations of a good lantern slide are (1) correct exposure and (2) suitable development.

Every beginner should certainly repeat the experiments here described. In this way he will learn more in an hour from the use and study of three lantern plates than from three months' unsystematic work. Select a negative of moderate density contrasts, and as far as possible the same general character all over the plate so that one part may be fairly compared with another (see Fig. 22). Putting this in a printing frame, put a lantern plate in contact (film to film) and close the frame. Expose for 5 seconds at 4 feet from a No. 5 Bray's gas burner. With a strip of card cover up one-third of the negative and give a further exposure to the uncovered two-thirds of 15 seconds. Then move along the card covering up two-thirds of the negative and give another exposure to the uncovered third of 40 seconds. Observe that the three strips have had 5 seconds, 5 plus 15 or total 20 seconds, and 5 plus 15 plus 40 or total 60 seconds. Moderate development gives a result shown in Fig. 22. Studying this plate we see under-exposure gives us feeble contrasts and clear glass in the high-lights, while over-exposure gives us further density but with reduced contrasts. From this experiment we deduce that correct exposure is somewhere between 5 and 60 seconds, let us say 20 seconds by way of example.

Test Exposures.

We now expose a second plate for 20 seconds, and then cut it up into three strips. The first strip is removed from the developer after about half the normal time, and the third strip is given double or treble the normal time of development. The middle strip receives normal development.

Development Test.

Fig. 23 shows us the result. Observe very carefully the difference between these two sets of strips. Over-development differs from over-exposure by the former giving us greatly increased density deposits. Under-exposure shows thinness and lack of detail in the high-lights. Under-development shows thinness also, but not with the same absence of detail in the high-lights. (The reproductions herewith given are only to be taken as rough guides, and not regarded as substitutes for personal experiment).

Combination of Errors.—Finally, in Fig. 24 we show an experiment combining the two likely errors. To our left we have an example of over-exposure with brief development. On the right is the same subject showing under-exposure and prolonged development. In the former case the two errors both tend towards reducing contrasts, and in the second case they tend to accentuating contrasts.

Application.—It will be easily inferred that when we have negatives lacking in contrast we may do something to compensate for this defect, either by full developing or slight under-exposure or a combination of the two. Similarly if the negative is too strong in contrast, our best plan is a generous exposure and watchfulness against carrying development too far.

Local Exposure.—In general, this means shading one part of the negative while light is passing through another part. A bit of card, with a suitably shaped hole cut out, enables us to do all we may require. In contact printing this is held in between the printing frame and the light. When reducing with camera it may be held on either side of the negative. In general, the shading card must be kept moving during the exposure, or harsh outlines will result. But in the case of a very dense part with sharp outlines (*e.g.*, a window) it may be desirable not to soften the outlines.

Local Development is carried out on lines similar to what has been said in No. 2 of this series of the *Practical Photographer*, page 57. But of course the small size of the lantern plate calls for greater deftness. In general, small soft hair brushes are

most useful for this purpose. Local exposure is of more practical use than local exposure in slide making.

When to Stop Development is one of the chief difficulties of the beginner, who hitherto has negative making experience. Bear in mind that the lantern plate is more thinly coated than the negative plate, and therefore the former will look somewhat over-developed as compared with the latter.

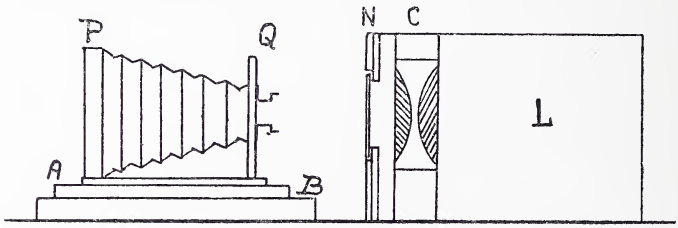

Fig. 46.

Illuminating the Negative when making slides through the camera. 1. Daylight reflected from a large sheet of white card, paper or opal glass is conspicuously uniform, but variable from hour to hour. 2. Magnesium wire or ribbon is cheap and portable. It also enables us to accentuate certain parts of the negative by local exposure. The burning strand should be moved to and fro from right to left and up and down from top to bottom of the negative, so that all parts are as evenly lighted as possible (see page 21, *Practical Photographer*, No. 2). Unless the negative is very dense, a sheet of ground or opal glass or tracing paper should be interposed between the light and negative. This diffusing screen should be at least an inch away from the negative. 3. Oil or gas lamps or incandescent electric light may be employed as explained on page 20, *Practical Photographer*, No. 2. 4. An enlarging lantern with condenser may be conveniently used, as in making an enlargement. But in this case the lantern objective is removed, and the slide-making camera and lens pointed towards the condenser, as shown in Fig. 46. The small camera may conveniently be raised to the proper height by means of one or more blocks of wood A, B, etc.

20

21

EXPOSURES.

	5″	5″ 15″	5″ 15″ 40″
Total	5″	20″	60″

Fig. 22.

Over. Normal. Under.

DEVELOPMENT.

Fig. 23.

Diagram Slides.—Although these are not strictly photographic preparations, yet it is often a convenience to a photographer to throw on the screen a sketch map, table of figures, diagram of apparatus, etc. The following methods are all useful in their way.

Light Grounds.—

1. Rub a bit of clear glass with a drop of retouching varnish until free from streaks. Set aside to dry and then draw with pen or brush in inks (black or coloured) or water colour.
2. Coat glass with thin gum arabic solution. Use water colours, with gum solution, and a rather soft brush.
3. Fix, wash, and dry an ordinary plate. Draw with Indian or waterproof ink.

Coloured Grounds,—

4. For coloured grounds, proceed as in No. 3, then soak the film in suitable dye or ink.
5. Or dissolve celluloid in amyl acetate, add the dye and flow on the plate, or plain collodion may be coloured in the same way.

Matt Ground.—

6. Very fine ground-glass may be used, and a drawing made with a rather hard fine-pointed pencil. The glass may then be made clear again by coating with any negative varnish, such as gum damar dissolved in benzole. But if very fine ground-glass be used this second step is not really necessary. Indian or waterproof ink, with pen or brush, may be used on ground-glass.

Dark Grounds.—

7. A piece of clear glass is evenly coated with soot from a lamp or candle flame, the design scratched away with a needle point, a thin card card mask cut and cover-glass laid on and bound in the usual way. The mask is used to prevent the two glasses touching. By rubbing the glass with beeswax before smoking, the soot adheres more firmly.
8. Clear glass may be coated with any opaque varnish, such as ordinary "black varnish" or bitumen, dissolved in benzole and made opaque

by rubbing up with gas black, etc., etc. When dry, the design is made by scratching with a fine point. For this purpose a needle held in a crochet needle-holder, or thrust into the end of a wooden pen holder is convenient; for broad lines a stout needle is broken in half and the end ground to a chisel edge.

Copying a Design.—If it is to be copied the same size as the original we must use a clear glass method, and lay the glass down on the design and trace on to the glass. If of different size, a negative may be taken and the diagram slide laid on the negative on a retouching desk and tracing made.

Diagram Slides by Photography.—Make a slide in the ordinary way. Trace the design with waterproof ink and a fine pen. Dry thoroughly, then dissolve away the photographic image by any of the reducers given on page 60.

Slides from Maps, Plans, etc.—Pin up the map against an evenly-lighted vertical wall. Set the camera with lens opposite the centre of the map. Be careful to get the camera back truly vertical and parallel to the map. Focus for centre and corners. Avoid over-exposure and prolong the development. Use amidol or quinol with full dose of bromide. The result is, of course, a negative; but for many purposes light lines on a dark ground do just as well as black lines on a light ground. If the lines are not clear, slightly reduce with ferricyanide and hypo, and, if need be, intensify afterwards.

Slides from Hard Negatives.—Make a positive in the usual way, avoiding harsh contrasts as far as possible. Then from this positive make a contact negative image of a thin weak contrast character. Bind the negative and positive image in contact. When developing the positive, allowance for the additional density of the negative should be kept in mind. For this method such a developer as Metol or Rodinal is particularly useful. Where a general softening is desired this should be obtained by interposing between the positive and plate for the second negative a narrow edge mask of stout paper or very thin card so that the two films are not in actual contact.

Backing.—A backed plate is never a disadvantage, and very often a great advantage. Lantern plates may be easily backed just before use with *(a)* burnt sienna rubbed up to a thick cream with thick gum water. A bit of black tissue paper is laid on the damp surface to keep the inside of the dark slide clean. *(b)* Indian ink rubbed up with alcohol 2 parts, water 1 part. This dries quickly. *(c)* Caramel in equal parts of water and alcohol is effective, but apt to be rather messy.

Spots.—In order that the lanternist may readily see in a dim light how to place the slide in the lantern, it is customary to put in each of two adjacent corners of the slide a white disc of paper of about this size. These discs are called spots. They may be cheaply bought ready gummed.

If the spots are put on the mask, *i.e.*, under the glass, they will not get torn off, as is often the case when put outside. Instead of discs of paper some workers make a circular patch on the mask with white water-colour paint. Another plan is to use a strip of white paper, on which the title is written. Then no spots are required. Another plan is to use a different binder strip for the top side of a colour different from the other three sides. Printed mask paper with two white discs and also a white space for writing titles are articles of commerce. All things considered, perhaps they are the simplest for general use.

Spotting.—As there are four pairs of adjacent corners on each of the two sides of a slide, we have eight ways of spotting a slide—of which seven are wrong. The right one is easily found:—thus. Lay the slide down on a piece of white paper so that the picture is the right way up and the right way round (*i.e.*, not reversed as to right and left), as it should appear on the screen. Then put on the spots in the two (right and left) *top* corners. When placing in the lantern the slide is put in the carrier with the two spots at the *bottom* corners and towards the light. The lantern turns the picture upside down just as the camera lens turns nature upside down on our focussing screen.

Binding Strips of suitable paper already gummed may be cheaply bought in various colours. Each strip is long enough to go round the four sides. It is convenient to cut them up into $3\frac{1}{4}$" lengths, and so avoid small "dog ears" at the corners, which often catch in the lantern carrier and get torn. Our universal friend the dealer provides us with several forms of holders, or so-called "vices," to hold the slide and cover together while the binding strip is put in position. But most workers follow the simple plan of holding them in the hand and pressing the two glasses down together upon the moistened strip. When selecting binding papers take a thin tough paper rather than a thick one. The use of different colours enables us to keep subjects or sets easily sorted. A different colour for the top edge answers in place of spotting when the title is written on the mask.

Advantages of Making Slides "Through the Camera."—1. By tilting the slide and the camera swing back distortion in the negative may frequently be corrected in the slide (see page 56, *Practical Photographer*, No. 2). 2. The scale-size of the slide picture may be varied, see page 57. 3. If the negative is larger than the slide, the whole or any part of the negative may be included in the slide. See Figs. 35-41.

A good Slide, as regards density, etc., is not easy to describe in words. Therefore the beginner is advised to obtain one from some acknowledged expert, and frequently refer to this as a standard. The best test is by means of the lantern and screen. Failing this, place a sheet of clean white card or smooth paper on a table opposite a window, in strong sky, but not direct sunlight. On it put a few small black ink dots. Hold the slide about six or eight inches away at a slope of 45°, and look at and through the slide by reflected light, noting the following points :—(1) There should be very little, if any, quite clear glass. (2) There should be few, if any, parts so dense that the ink spots cannot be seen through them. (3) There should be ample gradation between these two extremes.

Fig. 25.—LAND AND SKY ON TWO SEPARATE PLATES PUT FILM TO FILM.

Fig. 24.

OVER-EXPOSURE AND BRIEF DEVELOPMENT

UNDER-EXPOSURE AND PROLONGED DEVELOPMENT.

Fig. 28.

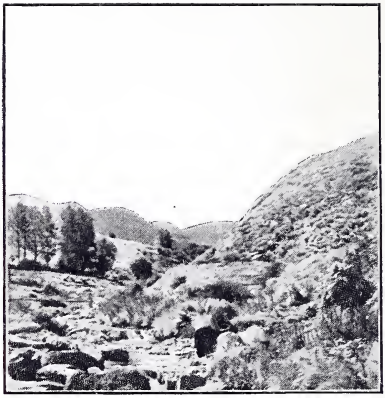

Fig. 29.

SKY ON ONE PLATE AND LANDSCAPE ON ANOTHER PLATE.

Fig. 26.

LAND MASK.

Fig. 27.

SKY MASK.

(See p. 49.)

Cloud Printing in Lantern Slides.

TWO cases are likely to occur to the practical worker. *First*, that of having land and sky (clouds, etc.) on the same negative, but the sky part so dense that it does not come out satisfactorily in the slide except when the land part is over-printed. *Second*, the case of a blank, cloudless sky, so that clouds have to be printed in, *i.e.*, combined from some other negative. In the first case the treatment is precisely similar to that explained and illustrated in the *The Practical Photographer*, No, 2, page 48, Figs. 26 and 27. Briefly put, this consists in making a trial strip or test slide, whereby we learn what is the best exposure (a) for the land part, and also (b) for the sky and cloud part. Suppose these to be 15 and 95 seconds respectively. We first expose the whole slide for 15 seconds, then cover up with a mask the land part and give an additional exposure of 80 seconds to the sky portion. In practice the only difficulty is in avoiding a hard junction-line between the sky and land. This is best attained by softening or vignetting the junction-line of the sky exposure. The land-mark should be very accurately cut to follow the sky-line. This mask is then put on the glass side of the negative, the front of the frame covered with tissue paper, and the frame gently "wobbled" about during the exposure. In the case of making a slide "through the camera" the land part is masked out as before, and then a second mask is held about an inch or so away from the negative and slightly moved during the exposure.

Combination Printing for the second case may be done in the following manner:—A contact P.O.P. print is made from the land negative. This is then carefully cut along the sky-line, and each part darkened by exposure to light (see Figs. 26 and 27).

If the landscape negative has a sufficiently dense sky free from spots, etc., we may not need the sky portion; but in any case it is just as well to be prepared for its use. Suppose we are printing by contact from a quarter-plate for the land and taking

our sky from a half-plate negative. First cut a card frame as shown in Fig. 44, so that we may be able to place the plate on the selected portion of the cloud negative. On the outside *i.e.*, the glass side of the negative fix the land mask; strips of gum paper will serve for this purpose. Then make the exposure for the sky and cloud part, covering the whole negative with tissue paper as before. On opening the printing frame stick a bit of gum paper on the back of the plate to show which is the sky part just exposed. Then transfer the plate to the landscape negative and expose for the land part. To get good register, cut strips of card to fit at the two sides of the lantern plate in the quarter-plate printing frame, so that when the negative is pushed up tight into one corner (marked to prevent confusion) and the card wedges inserted the plate will exactly occupy the pre-arranged position. In case of working from two large negatives, then a card frame such as that shown in Fig. 44 is cut for each negative. If using a camera for making the slide, we place our paper marks in front of the plate in the plate-holder. On this point consult pages 53 and 56 describing the making of framed slides.

Alternative Method.—Many workers prefer to use one plate for the land part, a second plate for the sky part, and bind up the two together, film to film, in contact. In this case it must be remembered that we are reversing the sky from right to left. Due allowance must be made for this in selecting the cloud negative, so that the lighting may be true to nature.

Advantages.—We may try the effect of different skies with the same landscape. The sky part may be intensified or reduced without affecting the land part. A hard junction-line may be softened by brush application of reducer. The sky portion may be tinted one colour and the land part another, if desired. Although this plan involves the use of two plates, yet the failures from faulty junctions are likely to be less in number and so equalize cost.

In Fig. 28 we have a sky on one plate, in Fig. 29 the land part only with clear glass for sky, and in Fig. 25 the two are shown together.

(Some further hints may be gleaned from pages 53-55 of *The Practical Photographer*, No. 1, Bromide Printing.)

Colouring or Painting Lantern Slides.

By A. M.

MOST people of cultured taste revolt against the coloured lantern slide. Probably this is largely due to the crude colours and careless or ignorant manipulation in most cases. The remedies are obvious. In all cases only transparent colours are of use. It is better to under rather than over-emphasize any colour. Suggestion rather than representation is what is required.

Water-colour Method. Pigments useful :—*Yellows:* Aureolin, gamboge, brown-pink. *Greens:* Viridian, verdigris. *Blues:* Prussian, Antwerp, ultra-marine, indigo. *Reds:* Crimson and madder lakes, rose madder. *Purple:* Purple madder. *Browns:* Burnt umber, asphaltum, burnt sienna, madder brown. *Black:* Blue black, ivory black, lamp black. *Brushes*: Two or three round sables and one larger sable mop. *Medium:* Gum-arabic 1 part, water 10 parts. The plate may be painted in its dry condition, or soaked in water and then all surface water removed by dabbing with clean muslin.

Oil-colour Method. This is the more usual plan. For list of transparent colour, see the water-colour method above mentioned. Media used are turpentine, copal or mastic varnish, gold size or Roberson's medium. Skies and flat tints are put in by dabbing with the finger end, previously rubbed smooth on a bit of pumice-stone, or the finger end may be covered by a bit of quite clean kid. Use a large in preference to a small brush, and one stroke rather than two. The less the colour is "messed about" on the slide the better it will show on the screen.

The Japanese Method. The Japanese are *facile princeps* in this matter. The following is said to be their method, or to give equally good results :—Dissolve gum-arabic 1 part

in water 4 parts. Tie a bit of muslin over the mouth of a small jar so that the muslin just dips into the surface of the water in it, and place the gum on the muslin. Strain through two thicknesses of *fine* muslin; add 1 part glycerin to 50 parts gum solution, and add a drop or two of carbolic acid. This medium is used with the following colours:— Brilliant yellow S, carbazol yellow, yellow wood extract, bright olive, dark olive and light green SF, platin scarlet, sorbin red, naphthol red, orange II, vesuvin brown, leather brown, methyl blue BG, indigotine IN, methyl violet B, nigrosin WL.

The effect should be judged by applying a drop of the gum colour to a bit of clear glass. The slide should be worked when in a horizontal position. One colour may be laid over another if the first is allowed to dry thoroughly before the second is applied.

Tinting, *i.e.*, staining the gelatine of a slide any desired colour is done by placing the slide in a suitable dye, such as Congo red, Manchester yellow, Malachite green, Hoffman's Blue, Methyl violet, Bismarck brown, dissolved in water or alcohol. If too dark, the excess may be removed by soaking in the uncoloured solvent, as the case may be.

Ordinary coloured glasses are generally too crude in colour for pictorial effect. But an unexposed plate fixed, washed, and then tinted, may be used as a cover glass. Tinting is very effective in certain cases provided the colour is merely suggested. The spectator should be hardly conscious of colour, but rather of general effect. For instance, the interior of a building, with windows, may be slightly tinted to suggest a pale yellow light outside. Snow scenes may have a suspicion of blue, etc.

Double Tinting effects may be obtained where two plates are combined to form one slide, as for instance, picture and frame on two slides, see Figs. 30-31, or sky and landscape, see Figs. 28-29, or when a thin negative and positive are combined for certain effects.

Where the stain or dye is only locally applied, we are approaching the subject of painting and colouring, see page 51.

Fig. 30.

SLIDE WITH PICTURE ONLY.

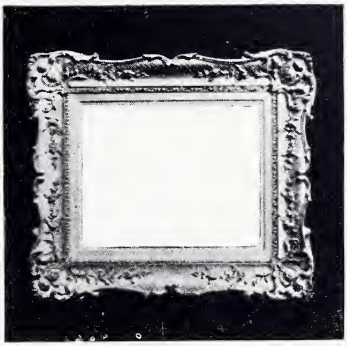

Fig. 31.

SLIDE WITH FRAME ONLY.

Fig. 32.

THE ABOVE TWO SLIDES CEMENTED TOGETHER.

(See p. 53).

Fig. 33. F. C. Lambert.

VIGNETTE AND FRAME COMBINED.

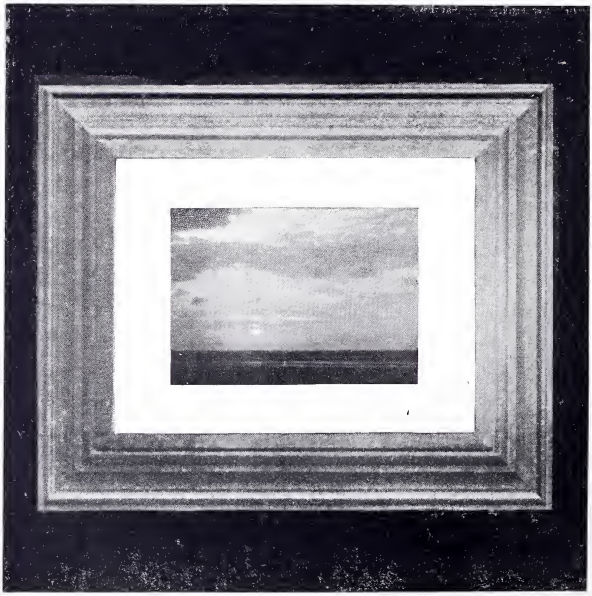

Fig. 34.

CLEAR MARGIN AND FRAME COMBINED.

(See p. 53).

Framed Lantern Slides.

By REV. F. C. LAMBERT, M.A.

THE ordinary lantern slide picture when compared with one having a frame border suffers very considerably by the contrast.

First Method.—Make a carefully finished print. Mount it and put it in a frame from which the front glass has been removed. Then make a negative of frame and picture together. From this new negative make a lantern slide. The drawback in this case is that our slide is made from a negative taken from a paper print, and therefore when enlarged on the screen will probably show some granularity.

Second Method.—Make a positive or transparency on glass. Fix this in a frame, and fix the frame so that it will not easily move. Then arrange a cardboard reflector behind the positive and expose the new negative by *transmitted* light. Cap the lens. Remove the transparency and replace it by a sheet of card covered with black cloth. Now expose a second time for the frame (being careful not to shift the camera or frame between the two exposures). For the second exposure a front *reflected* light is only used. Result, a negative of transparency and frame combined.

Third Method.—Select a frame having an opening with desired *proportion* of length to breadth on the part of negative to be printed. For example, if the picture part of negative is 3×2 inches we may use a frame with 6×4 or 9×6 or any other similarly proportioned opening. In place of or in front of the glass in the frame put a sheet of white paper or card. Hang up the frame flat against a vertical wall so that the lens is opposite the centre of the frame opening. Focus so that the outside of frame comes well within a 3×3 inch square, ruled centrally on the ground glass. Make a fairly strong contrast negative of such a character that it gives a good P.O.P. print of the frame, while the centre is yet white paper. Now with a fine pointed sharp

knife cut out the white centre of frame neatly so that both parts of this paper mask fit exactly. Allow both the "frame" and "centre" to blacken in strong daylight. Mark their backs so that their corresponding positions are at once seen. Call them the "frame" and "centre" mask respectively. Now trim the frame mask to the exact size ($3\frac{1}{4} \times 3\frac{1}{4}$) of a lantern slide—lay this on the negative in such position that the desired picture is seen through its opening. Push the negative close up to one corner of the printing frame and fit a bit of card so that when a lantern plate is laid on the mask in the selected position it is "jam-tight" against the card.

Replace the picture negative by the frame negative. Lay the frame mask on the frame negative so that it is in exact register and in the same way fit another card so that a lantern plate pushed up close to the card exactly coincides with the mask. Now trim away a *very* narrow shaving all the way round from the centre mask and fix it on the glass side of the frame negative to act as an additional precaution.

To make a framed slide.—Put the picture negative in the printing frame, then the card strip, and then the slide mask and finally the slide. Expose. If we developed now we should have a picture with clear glass margins due to the frame mask. But instead of developing we change the picture negative for the frame negative, or if preferred, use two printing frames (one for each negative) and make a second exposure on the *same lantern* plate behind the frame negative. This gives on development a framed slide on one plate. It will easily be seen that the condition of success is a matter of getting the two exposures on one plate to register perfectly. This only requires great care and accuracy in placing the lantern plate and card wedges. The interposition of the frame mask between the plate and negative for the picture involves a very slight loss of sharpness. But if the exposure is made at not less than 3 feet from a gas jet and the frame kept still during the exposure this slight loss will not be appreciable.

An alternative plan is to use separate plates for the picture and frame and then when both are

finished and dry to fix them together face to face. Although this plan requires two plates for each slide, yet in the end it will probably be found to work out cheaper, as we have no loss due to errors of register. Because we can when binding up adjust the two to fit exactly if only the masks have been properly cut. The two separate plates are shown in Figs. 30 and 31.

Fourth Method.—This applies to making slides through the camera. But here we need a frame mask fastened on to the ground glass so that we can adjust matters so that the selected portion of the picture may come centrally on our plate. We now place a duplicate frame mask in the plate holder and in front of the plate to shield the margin. The frame mask and plate should always be pushed up close into one corner of the carrier. The frame is made on a separate plate in the manner already described.

Cementing.—When the frame and picture are on different glasses it is well to cement the two face to face by means of diluted Canada balsam. A suitable mixture is Canada balsam one part, and either chloroform, benzole or xylol two parts. A large drop of this syrup-like mixture is taken up with a glass rod and allowed to flow on to the centre of one plate. The other plate is placed face down upon the first. Its weight will cause the drop to slowly spread out to the size of a half-penny. We can then easily adjust matters so that the two plates are in register. They are laid on a bit of clean paper in a horizontal position, and a small heavy object placed thereon. Some balsam may exude at the edges. This is removed by a warm knife blade and the slide bound up after two or three days' time in the usual way. Fig. 32.

Clear Margins.—By cutting the opening of the frame mask smaller than the opening we get a picture with a clear margin showing round it. See Fig. 34.

Vignetting.—In the third method we vignette by using a card with small opening and moving this about all the time of the exposure. In the fourth method the vignetting card is similarly used on either side of the negative. See Fig. 33.

Framed Slides—Supplementary Notes.

By CAPTAIN J. S. HENDERSON,

When making negatives of frames a wall paper background may be used. This on the screen has a very realistic effect.

To prevent confusion mark the frame negative and its mask with corresponding numbers or letters.

Tinted borders.—Negatives for this purpose may be made by exposing a slow plate to light and developing for the required amount of density.

Black lines on the slide are obtained by cutting clear lines through the border negative film with sharp knife and straight edge.

Light lines are similarly obtained by ruling opaque lines on the border negative, using a drawing pen and Indian ink.

Rubber bands will be found useful for holding the plate and mask together when they are in the dark slide.

Enlarging Lantern process.—Make two frame masks. Temporarily fix one to the film of a lantern plate and use this on the easel as a focussing screen. Keep this away from light when not in use. Fix the second mask to a clear glass cover lantern slide size. Having selected and focussed the picture, put the yellow cap on the lens. With rubber bands put the mounted mask on clear glass, mask side to the film of an unexposed lantern plate. Adjust so that the selected picture falls within the mask. Expose in the usual way.

The frame may be made by contact on the same plate or on a second plate in the manner already described.

Border Printing.—On pages 30-33, *The Practical Photographer*, No. 1, is an article on printing tinted borders round Bromide prints. By substituting "lantern plate" for "bromide paper" the method there given may be applied to slide making.

Fig. 35. J. C. A.

Figs. 36-41. J. C. A.

(See p. 57).

Pictorial Pointers for Lantern Slide Makers.

By J. C. ALLEN.

WHAT has already been said on the subject of art hints for bromide paper prints in general applies to lantern slides with equal force. Will the reader, therefore, kindly refresh his memory by a glance at pages 56-60 in *The Practical Photographer*, No. 1, Bromide Printing, and imagine that he is reading some hints about lantern slide making. This done, we may now turn to the very important subject of composition, *i.e.*, the arrangement of the subject.

Selection.—The negative having been taken, the slide maker is now limited to selection as his chief means of arrangement. In Fig. 35 is shown the reproduction of a whole-plate print, and in Figs. 36 to 41 we have six slides differing from each other and from the negative from which they were derived.

Subject included.—Commencing from above, we find they include less and less of the original as we get lower down.

Scale.—As the quantity of subject-matter selected gets less, so the scale increases. For the purpose of scale comparison the boat was purposely included in all six selections. The difference is easily seen by comparing the size of the boat in the various figures.

Interest.—By comparing the examples with the largest and smallest boat, we see that in one case the boat is a comparatively insignificant item, while in the lower left-hand picture it is, perhaps, the most important part of the composition.

Life size.—When selecting lantern slide subjects always try to imagine the size of the picture on the screen. Every one can recognise the unfitness of a portrait of an infant shown of gigantic size on the screen. The same is true of other subjects, though

the fault may not be so glaring. Well-known animals, *e.g.*, horses, cattle, etc., should be kept within reasonable measure of life size. Though some little licence may be taken in consideration of the fact that those at a distance from the screen will have the visual angle reduced.

Still life objects form an exception, as do other small objects that we may be supposed to handle. It would be absurd to show—say a bunch of roses life size on the screen in a large hall. In such cases the size of the object should be such as to suggest a life-size easel picture in a frame of, say, roughly not exceeding 2½ feet longer side.

Definition.—The commonest mistake among lantern slide makers is that of always getting the sharpest possible result all over the slide. A lantern picture, like any other large picture, will depend for success more on general effect than on local detail. Indeed, provided the absence of texture significance is not conspicuously absent or false, the less the detail the better.

Atmosphere.—Every one knows by experience that on a very clear day we see distance detail more clearly than on a day whereon we half unconsciously recognise the presence of the atmosphere. Thus self-assertive detail on the screen tends to suppress the suggestion of aerial perspective of the scene.

The subject itself should always be a guide to the degree of detail desirable. Thus, in a cloudscape we look for little or no detail. In an architectural study of a portion of a building, *e.g.*, a bit of carving, etc., we frequently are as interested in the detail as in the general effect. No rule should be laid down. Every picture is a law unto itself.

Overcrowding of too much subject-matter is a very common fault with lantern slide makers. The eye is confused rather than pleased. A glance at the six examples, 36 to 41, shows that the larger scale results towards the bottom are more pleasing than the smaller scale subjects above, which include too much subject matter.

The Colour of a slide should be appropriately chosen to *suggest* rather than imitate the prevailing general hue of the scene.

Lantern Slide Making.

Formulæ, Notes, Hints.

By THE EDITOR.

The reader is invited to supplement the hints here given by those of a similar nature on pages 62-64 of No. 1, *The Practical Photographer*, "Bromide Printing," and pages 60-64, No. 2, *The Practical Photographer*, "Bromide Enlarging."

White Ink for writing Titles on Masks.—Oxide of zinc, sulphate of barium, or any other white powder insoluble in water, may be mixed with weak gum water to convenient consistency. Moist water colour, Chinese, or other white pigments may be applied with a fine brush.

Coloured Ink for writing on Glass.—Copal, ½ oz.; oil of lavender, 4 ozs.; any transparent pigment or oil colour, *vide* page 51.

Approximate Equivalent Exposures.—2 inches magnesium ribbon at 24 inches distance; 50 seconds at 1 foot from a 10 candle power electric light; 60 seconds at 1 foot from a Bray's No. 5 gas burner.

Relative Times of Exposure for various Colours.—Calling the time of exposure for black and white tones T. Then 2 T gives warm black or dark brown, 4 T purple brown, 8 T purple brown, and 12 T red chalk colours.

Varnish for Slides.—A protection against damp and injury. Varnishing slightly lightens the lights and shades of the slide.

1. Gum damar, 20 grains; benzole, 1 oz.
2. Copal resin, 25 grains; benzole, 1 oz.
3. Pyroxeline, 5 grains; amyl acetate, 1 oz.

Clearing Baths.

1. Water, 20 ozs.; alum, 1 oz.; citric acid, 1 oz.; ferrous sulphate, 2 ozs.
2. Water, 10 ozs.; thiocarbamide, 100 grs.; alum, 100 grs.; acetic acid, 1 drm.

Fixing Bath.

Water, 20 ozs.; soda sulphite, 1 oz.; hypo, 5 ozs.; sulphuric acid, 20 drops.

Paste for Slide Binders.

1. Sugar, 1 part; water, 2 parts; fish glue, 4 parts.
2. Ordinary French glue, 1 part; water, 6 parts; soak and melt by heat; add oil of lavender or spike enough to give a decided odour (to act as preservative).

Diagram Slides.

1. Expose a plate to light; develop for maximum density. Scratch design through film with fine point. Fill up the lines with coloured ink, or use a coloured glass slide cover.
2. Expose a plate to light. Mix a strong developer with a little glycerine. Draw the design with a small brush and this concentrated developer. The slide may be used without fixing, or fixed and tinted by soaking in any staining solution.
3. Ground glass varnish, for drawing upon with soft crayon or pencil. Sandarac, 10 grs.; mastic, 10 grs.; benzole, 1½ oz.; ether (meth.) 1 oz. After the drawing is made, flow with sandarac, 15 grs.; mastic, 15 grs.; ether (meth.) 1 oz., when this ground glass effect disappears, and the diagram is apparently a drawing on clear glass.

Reducers.

1. Potass Cyanide, 10 per cent. solution ½ dram; Iodine in alcohol 10 per cent. solution, 5 to 10 minims; water, 1 oz. Useful for local application.
2. Hypo, 1 oz.; water, 4 ozs; potass ferricyanide, 10 grs. (Does not keep in solution).
3. Water, 1 oz.; ammonium persulphate, 10-12 grs. (Does not keep in solution).
4. Potassic ferri-oxalate, 200 grs.; soda sulphite, 200 grs.; water, 10 oz.; when dissolved add crystals of oxalic acid until the solution turns green; then add hypo, 2½ oz. (This keeps fairly well in solution).

Intensifiers.

1. Bleach in saturated solution mercuric chloride; wash well, and darken in acid ferrous oxalate developer.
2. Water, 2 oz.; citric acid, 25 grs.; pyro, 10 grs.; silver nitrate, ½ gr.

Developers.

1. **Pyro-Ammonia.** A. Water, 10 ozs.; potass metabisulphite, 1 drm.; pyro, 1 drm. B. Water, 10 ozs.; am. bromide, 1 drm.; liquid ammonia, 1 drm. Use equal parts. Warm black tones.
2. **Pyro-Caustic Soda.** Water, 10 ozs.; soda sulphite, 3 drms.; ammon. bromide, 30 grs.; ammon. carbonate, 1 drm.; caustic potash, 50 grs.; pyro, 40 grs. Warm black tones.
3. **Pyro-Acetone.** A. Water, 10 ozs.; pyro, ½-oz.; soda sulphite, 3 ozs.; sulphuric acid, 30 mins. B. Water, 10 ozs.; acetone, ½-oz. Use equal parts of A and B. Warm black tones. By increasing the proportion of B warmer tones are obtained.
4. **Hydroquinone** (Quinol). A. Water, 10 ozs.; potass metabisulphite, 1 drm.; quinol, 80 grs.; potass bromide, 20 grs. B. Water, 10 ozs.; caustic soda, 80 grs. C, Water, 10 ozs.; ammon. bromide, ½-oz.; ammon. carbonate, ½-oz.

Normal exposure; ½-oz. A; ½-oz. B; 2 drms. C; 1 oz. water; Brown tones.

One and a-half times or double normal exposure: ½-oz. A; ½-oz. B; 4 drms. C; 1 oz. water. Purple brown tones.

Three or four times normal exposure: ½-oz. A; ½-oz. B; 5 drms. C; 1 oz. water. Purple tones.

Five to ten times normal exposure: ½-oz. A; ½-oz. B; 6 drms. C; 1 oz. water. Various shades of red. (See Mr. T. T. Baker's Notes, p. 34, also Figs. 17 and 18).

5. **Eikonogen.** Water, 10 ozs.; soda sulphite, 2 drms.; potass bromide, 3 grs.; soda carbonate, 1 drm. Warm black tones.

6. **Metol.** Water, 10 ozs.; soda sulphite, ½-oz.; metol 25 grs.; potass bromide, 5 grs.; soda carbooate, ½-oz. Cool black tones.

7. **Ortol.** A. Water, 10 ozs.; potass metabisulphite 50 grs.; ortol, 80 grs.; potass bromide, 10 grs. B. Water, 10 ozs.; soda sulphite, 1 oz.; soda carbonate, 1 oz. Use equal parts A and B. Black tones.

8. **Kachin.** A. Water, 10 ozs.; soda sulphite, 1 oz.; kachin, 1½ drms. B. Water, 10 ozs.; soda phosphate, 2 ozs.. caustic soda, 1½ drms. Warm black tones.

9. **Synthol.** Water, 10 ozs.; soda sulphite (*pure*), 1 oz.; potass bromide, 20 grs.; synthol, 40 grs. Black tones. Warm tones with increased exposures.

10. **Amidol.** Water, 10 ozs.; soda sulphite, ½-oz.; potass bromide, 5 grs.; amidol, 25 grs.

11. **Edinol.** Water, 10 ozs.; edinol, 40 grs.; sodium sulphite, 1 oz.; potass carbonate 2½ drms. Black tones. If the 1 oz. of sodium sulphite be replaced by 120 grs. of acetone sulphite, warm tones result. Another for warm brown tones: Water, 10 ozs.; potass metabisulphite, 2 drms.; potass carbonate, 5 drms.; edinol, 40 grs.; potass bromide, 30 grs.

12. **Glycin.** Water, 10 ozs.; soda sulphite, 1 oz.; glycin, 1 drm.; potass carbonate, ½-oz.; potass bromide, 10 grs.

Formulæ for Stand Development.

1. Water, quart; soda sulphite, 4 ozs.; quinol, 100 grs.; potass carbonate, 50 grs.

2. Water, 1 quart; soda sulphite, 1 oz.; amidol, 30 grs.

3. Water, 1 quart; potass carbonate, 30 grs.; pyro-catechin, 15 grs.

4. Water, 1 quart; soda sulphite, 1 oz.; potass carbonate, 50 grs.; glycin, 50 grs.

In stand development use water that has been boiled and allowed to stand until cool. Temperature for stand development should not be below 50° F., and preferably between 60° and 65°.

Toning.

1. **Platinum.** Water, 10 ozs.; potassium chloroplatinite, 3 grs. Acidify with Nitric acid.

2. **Gold.** Water, 1 oz.; gold chloride, 1 gr. This bath works very slowly and gives blue-black colours.

3. **Gold.** Water, 1 oz.; gold chloride, 1 gr.; soda phosphate, 5 grs. Warm purple tones.

4. **Gold and Platinum.** Water, 5 ozs.; gold chloride, 1 gr.; potassium chloroplatinite, 2 grs. Acidify with nitric acid. Warm black tones.

5. **Fixing and Toning.** Water, 4 oz.; hypo, 1 oz.; ammonium sulphocyanide, 50 grs.; gold chloride, 2 grs. Warm black to purple tones.

6. **Molybdenum.** See page 22.

7. **Vanadium.** Ammonium vanadate, 20 grs.; water, 4 ozs.; acetic acid, 1 dram; potass ferricyanide, 12 grs. Yellow grey tones.

8. **Iron.** Water, 4 ozs.; ammonio citrate of iron, 10 grs.; nitric acid, 5 drops; potass ferricyanide, 10 grs. Prussian blue colours.

9. **Iron.** Water, 4 ozs.; ferric oxalate, 10 grs.; nitric acid, 5 drops; ammonio citrate of iron, 5 grs. Greenish-blue tones.

10. **Schlippe's Salt.** Bleach slide in potass bicromate, 30 grs.; water, 1 oz.; hydrochloric acid, 5 drops. Wash well. Transfer to Schlippe's salt, 15 grs.; water, 1 oz. Colour-range from red-brown to brick red according to the time of immersion in the bleaching bath.

11. **Uranium.** Water, 4 ozs.; uranium nitrate (or acetate), 20 grs.; acetic acid, 20 drops; potass ferricyanide, 15 grs. Tones—warm black, warm brown, to dull warm red. Wash in water, 10 ozs.; acetic acid, 1 dram. Then immerse in ferric-chloride, 4 grs.; water, 4 ozs. Various shades of greenish browns; or by using water, 4 ozs; iron protosulphate, 1 dram; sulphuric acid, 5 drops, a brighter green is obtained.

12. **Copper.** Water, 10 ozs.; potass citrate, 1 oz.; copper sulphate, 55 grs.; potass ferricyanide, 45 grs. Warm blacks, purple reds. See Fig. 20 in *Practical Photographer* No. 1; also Figs. 21, 22 and 23 in *Practical Photographer* No. 2.

13. **Hypo Alum Toning.** For lantern slide toning: In 30 ozs. of boiling water dissolve 1 oz. alum and 4 ozs. hypo. This should be used in a grooved earthenware tank, so that the plates may stand on edge. The temperature of

the bath should be between 60° and 70°. Toning takes place somewhat slowly. It requires some little practice to know what the colour in the lantern will be from an inspection of the slide in the hand. For warm hypo alum toning the slide must first be soaked in one part formalin; water, 10-12 parts, for ten minutes; then washed and dried. It may then be toned in the hot hypo alum, at temperature 90-120°F.

14. **Sulphur.** Water, 10 ozs.; potass bichromate, 25 grs.; table salt, 50 grs.; alum, 80 grs.; nitric acid, 20 drops; sulphuric acid, 40 drops. Bleach in the above, wash and immerse in solution, either of hydrogen sulphide or sodium sulphide.

Toning Lantern Slides.

15. **Mercury.** Bleach in a saturated solution of mercuric chloride; wash for half an hour in running water, then immerse in (*a*) 10 per cent. washing soda, for red-brown colours; or in (*b*) 10 per cent. soda sulphite, for warm black colours; or (*c*) 20 per cent. hypo solution, for cool brown colours; or (*d*) lime water, for purple brown colours; or (*e*) potass metabisulphite, 10 per cent., warm black colours; or (*f*) gold chloride, 1 gr.; water, 2 ozs.; ammon. sulphocyanide, 10 grs., for blue-black colours. By prolonged immersion in (*f*) various shades of blue are obtainable. Yellow stains may usually be removed by bathing in hydrochlorde acid, 1 part; water, 25 parts. (*g*) Soda sulphide, 10 grs. per oz., warm brown tones; (*h*) ammonium sulphide solution, 1 part; water, 10 parts, or ammonia, 10 min., water, 2 ozs.; warm brown tones. (*i*) Bleach in saturated solution of mercuric chloride; wash well and tone in equal parts of A and B. (A) ammon. sulphocyanide, 40 grs.; Hypo, 1 gr.; water, 6 oz. (B) Gold chloride, 5 grs.; water, 5 ozs. Colour changes through browns to blue-black and towards blue, with intensifying action. The bleached side, after well washing, may be dried and used without further treatment. The colour in the lantern is rather warm muddy brown.

16. **Lead Process.** This is an intensifying and colour changing process combined, and therefore only suitable for somewhat weak images.

A. Water, 2 ozs.; lead nitrate, 20 grs.; potass ferricyanide, 30 grs. Nitric acid drop by drop, until the solution just clears. Bleach and wash well in running water. (A pale white yellow slide at this point.) Now immerse in ferric-chloride, 3 grs.; water, 1 oz. A rich Prussian blue; *or* in iron protosulphate, 20 grs.; water, 1 oz.; sulphuric acid, 3 drops, a greener result obtained; *or* transfer to potassium chromate, 1 part; water, 20 parts. (A pale sulphur yellow slide results.) Wash well again and transfer to either of the above iron baths, when a greenish grey results.

Print-out Plates.

The plate is put behind the negative in a pressure frame, and printed in daylight. Printing is judged by opening half the frame and looking through both negative and plate. A slight purple tinge should show behind the densest parts of the negative. There is some printing loss in after operations.

Combined fixing and toning bath for print-out plates.—Water, 10 ozs.; hypo, 1 oz.; potash alum, ¼ oz.; soda sulphate, ¾ oz.; gold chloride, 2 grs.; lead acetate, 8 grs. The plates are not washed before toning. At first they go yellow-red, then back to red, and on to rich purple.

A Table of equivalent exposures for various distances from the source of light.

Feet from Light.	1	2	3	4	5
Ratio of exposure ...	1	4	9	16	25
,, ,, ...	¼	1	2¼	4	6¼
,, ,, ...	⅑	4/9	1	1⅞	2⅞

Thus the equivalent times at 3 and 4 feet are as the squares of these numbers, *i.e.*, 9 to 16, or 1 to 1⅞, *i.e.*, the exposure at 4 feet should be *nearly* double that at 3 feet for the same effect. Suppose that an exposure of 24 seconds at 4 feet is found correct, but it is required to reduce the distance to 2 feet. The second horizontal row of figures gives us the ratio of 1 to 4 for distances 2 and 4 feet, so ¼ of 24 or 6 seconds at 2 feet is equivalent to 24 seconds at 4 feet.

A Table showing (approximate) conjugate distances for reducing negatives to lantern size.

Size of Negative.	Focal Length of Lens.									
	5″		6″		7″		8″		9″	
	Conjugate Distances.									
(¼-pl.) 4¼×3¼ ...	11¾	8¾	14¼	10¾	16¼	12¼	18¾	14	21	15¾
5 ×4 ...	13¼	8	16	9¾	18¾	10½	21¼	12¾	24	14½
(½-pl.) 6½×4¾ ...	16	7¼	19	9	22¼	10¼	25¼	11½	28½	13¼
7½×5 ...	17½	7	21	8½	24½	10	28	11¼	31½	12½
(¼-pl.) 8½×6½ ...	18½	6¾	23	8¼	27	9½	30¾	10¾	34½	12¼
10×8 ...	21¾	6½	26	7¾	10	9	34¾	10¼	39	11¾
12×10 ...	25	6¼	30	7½	35	8¾	40	10	45	11¼

For example, if reducing a whole-plate negative (8½ × 6½) to fall within the 3 × 3 picture space with a 7 inch lens, we should have approximately 27 inches between the lens and negative and 9½ between lens and plate.

Note.—By adding together the two conjugates we get the base-board length.

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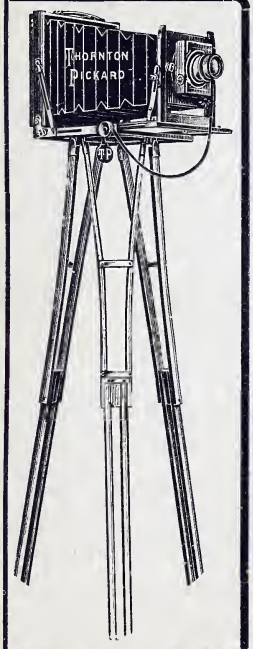

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Notice to Correspondents.

Will Correspondents, Querists, and Senders of Prints for Criticism, please let us have their communications before the *15th of each month*, so that we may do our best to reply in the succeeding number.

Junior Salon.

We have not been able to fix quite definitely the date for sending in prints to our next Junior Salon, but we strongly advise intending competitors to be preparing their work, so that it may be ready to be sent in *early in March.*

Criticism of Prints.

It is our intention to make the criticism of prints a special feature in our pages. The Editor will give his personal careful attention to this matter, and will aim at making every criticism a practical, interesting, and instructive object-lesson. By paying attention to the hints thus given, often a poor print may be improved and a good print followed by one still better. In order to encourage readers to take great care in the preparation of the prints they send us, we shall offer **Three Prizes of Five Shillings** each for the three best prints sent in each month. The winning prints will not be returned.

To meet the convenience of those readers who are preparing prints for special dates (exhibitions, etc.), and cannot conveniently wait for printed criticism in our columns, we have arranged that readers may send us one, two, or three prints with the usual Print Criticism Coupon and a few of 2s. 6d. for each print sent. Within a week the prints, accompanied by a type-written criticism, will be returned to the sender. The return postage must be prepaid in the usual way as in Rule 5. The special fee, 2s. 6d., should be sent in a separate envelope, with name and address of sender, and *not* with the prints for criticism.

Prints Criticism Prizes.—During the month of October a large number of prints were sent in for criticism. On the first of November these were all carefully compared, with the result that the three prizes of five shillings each are assigned to **Miss M. E. Bruce,** "What's Happening?" Fig. 19; **G. W. Saunders,** "The Undercroft, Wells;" **W. H. Witts,** "Epping Forest," Fig. 18.

Readers will, of course, understand that the colours of the prints here reproduced are entirely different from the original photographs.

A P.O. for 5s. will be posted to each of the three prize winners on Dec. 1st.

Miss M. E. Bruce. "What's Happening?"—A charming bit of genre. The weak point of so many pictures of this kind is that the figures look conscious and stiff. In this instance one does not think of a camera, and the quite childilke pose is at once convincing. Unconsciously one joins these youngsters in looking for some interesting object to our right. Technically good except that the foliage in the left upper corner is a little too black even for dark green leaves. Mounting and trimming are eminently satisfactory. This pictures drives home the lesson that the simplest subjects and surroundings are the most pleasing and convincing. Our artist here shows wisdom in keeping out of the composition everything and everybody not needed to convey the story. This picture is stronger on the pictorial than the technical side, although the technique is decidedly above average quality.—Fig. 19.

G. W. Saunders. "The Undercroft, Wells."—An excellent example of first-rate technique, but open to criticism from the pictorial side. It is seldom satisfactory to have a dark centre and light sides, the opposite arrangement is far stronger. The spacing between the centre pillar and those to our left and right are too nearly equal for best effects. The small high-light of open door in distance is in conflict with central pillar, patch of light on floor and two side pillars. The upper part in centre somewhat too dark and solid. Camera should have been lowered nearer the ground. The white band of mount round print a serious mistake. This weakens the already too weak margin.

W. H. Witts. "Epping Forest."—The pictorial and technical merits of this picture are about equal—a very healthy sign which makes us look forward with confidence to steady progress on the part of this worker. The print arriving early was criticised (H.W. H., Clapton) in No. 2 of the P.P., but the judging did not take place till the last day of October.—Fig. 18.

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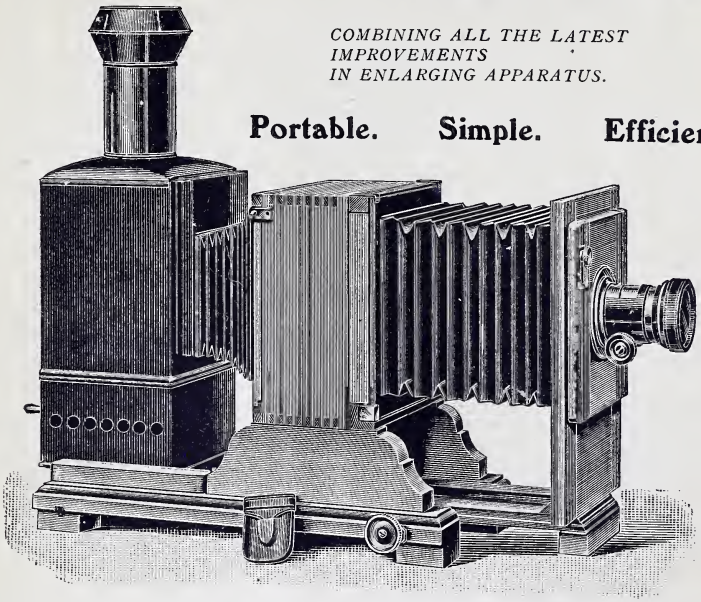

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A. E. Burnett (Bristol). "Wolford Manor."—In this instance we see a case where a considerable share of merit goes to the subject. This delightful old-world corner, even with indifferent photography, would still be delightful on its own merits, but Mr. Burnett's work is very far from being indifferent. It is, in fact, exceptionally good. Technically there is but little fault to find. The left lower corner is somewhat weak and not dark enough. The paved pathway comes too instantly, and should be locally printed a little darker, for at present this rather large patch of light gives a somewhat top-heavy suggestion. The quality of the building on our right calls for nothing but the highest praise. Fig. 12.

W. Pickering (Bishop Auckland). "An Old Bachelor."—Here again is a work of very considerable promise. Indeed it is even now so very nearly being quite good that one regrets that its author had not had a little longer time in working it up. The unconventional dress and easy pose of the figure at once engage our sympathetic attention. At present the lighting is a little patchy. As one looks at the print with nearly closed eyes one sees rather too many scattered high-lights, e.g., the ball of wool on the knee, the left fore and upper arm, back of the right hand (for this one does not at once see any origin), bit of something light peeping out of the vest pocket. All these lights are hardly sufficiently subdued relatively to the chief high-lights about the head and face. The lower part of the background also might advantageously have been a little darker. Fig. 13.

G. H. Haycox (Worcester). "Windswept.—This print gives us the impression of a vigorous sketch rather than a finished picture. The subject of these wind-trained trees over-arching the road is an impressive and attractive one. The eye that sees and seizes upon a subject of this character is fully alert, and should have no difficulty in finding other striking effects. The suggestive, impressionistic pictorial side of this picture is in advance of its technical qualities. The somewhat harsh contrasts of light and shade suggest a negative that has been under-exposed or over-developed or, more probably still, partaking of a little of each of these faults. Still a vigorous subject of this character has a kind of special license for exceptionally vigorous treatment. It is very doubtful indeed if the black and white narrow bands round this print have not done more harm than good. Fig. 14.

J. Harbottle. "Winter Stillness."—The reader must not be over-hasty in forming any opinion of the original print from the reproduction here set before him, for it would be hardly reasonable to expect an exact rendering of the subtle renderings of delicate shadows in a print reduced to about one-fifth its original dimensions. In this print there are three points worthy of special praise. First, the admirable rendering of delicate shadows in the broken snow; next, the eminently satisfactory sky; and third, the avoidance of getting the gate and fence unduly black. In snow pictures there is a general tendency to under-expose and over-develop, and thus accentuate the already strong contrasts of light and shade. The composition of this picture is not altogether satisfactory, but we fully recognise that the operator was seriously handicapped in the matter. The colour of the mount is hardly cold enough for a snow subject. Fig. 16.

G. Watson (St. Andrews, N.B.). "The Market Boat."—A delightful and altogether charmingiy suggestive picture. The atmospheric quality of this small print is remarkable, but the boat and figures seem unduly dark—an effect which probably would not be so marked in an enlargement from this negative on rough tinted paper. We incline to think that a narrow strip removed from the left-hand side—just enough to cut away the buoy—would simplify and so considerably improve the form of this composition. The colour of the print is somewhat cold, and the use of a brown and green mount is of questionable value. The particularly picturesque nature of the reflections in the water should be noted. Fig. 9.

Hilda Stevenson (Birkenhead). "The Maiden's Prayer."—This is a somewhat original, and, therefore, all the more interesting endeavour to treat a conventional subject in a somewhat unconventional manner. And although complete success has not followed this praiseworthy attempt, yet it is full worthy of commendation, and promises well for the future of the worker. The shadow on the cheek is a little too strong and sudden when taken in conjunction with the large space of strongly-lit drapery of the body. Thus the body rather than the head claims first attention. In another attempt this model might assume a rather more dreamy-devotional, and less conscious, "must-hold-still" expression. Give double the previous exposure, dilute the developer with equal quantity of water, and do not carry development quite so far, aiming at delicacy rather than vigour of contrast. Fig. 10.

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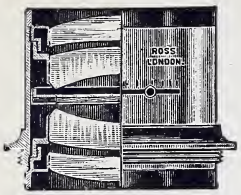

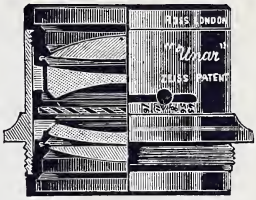

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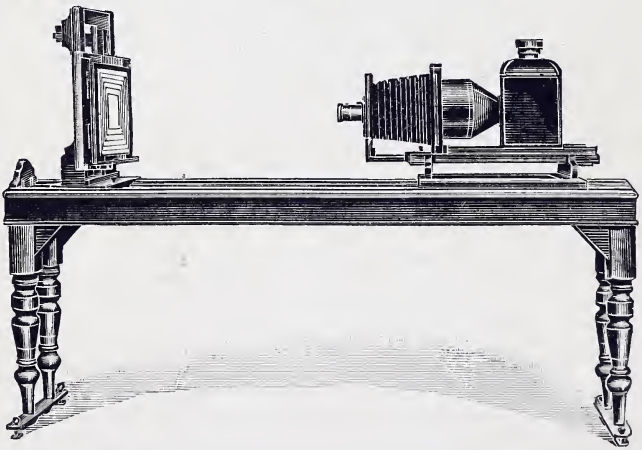

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J. A. Pitchforth (Huddersfield). "Bolton Abbey."—The first thing to catch the eye is not the print, but the over-largely written title in white ink—an error which may easily be avoided on other occasions. The print itself is a piece of neat and careful photography, with a tendency to somewhat excessive light and shade contrasts. The near part of the grass seems to come rather too light when compared with the much darker and more distant trees. This tends to give a kind of top-heavy effect. It is highly probable that a rather more harmonious print could be obtained from the negative by printing it in some other process—such, for instance, as platinotype or carbon. Fig. 15.

Mrs. W. R. Kent. "Cottager of Axmouth."—This reproduction hardly does full justice to the excellent suggestion of bright sunshine on the wall. But unfortunately the over-strong contrasts of density have given a snow-like look to the flagstones, etc. The old lady's cap is also lacking in gradation of tone. The strong point of the composition is its praiseworthy simplicity. But it is a serious mistake either to under-expose or over-develop for sunshine effects. What we then need is transparency, not hardness of shadows. Fig. 17.

W. H. Lindsay (Hamilton, N.B.). "Flower Study."—Altogether a very creditable piece of careful work. Without having the original flowers before us we cannot, of course, be quite sure that the relative values of the colours are correct. But, apart from this point, the print is technically good. Pictorially regarded the grouping is tasteful, except that all the blossoms are made to face one way. All your "sitters" are staring at the camera, an arrangement which always at once suggests human intervention—just the thing one does not want to bring to mind. This print has been tastefully mounted with quiet shades of olive green. Next time we suggest your trying a rather darker background. Fig. 11.

R.L. (Castlemartyn).—1. Much the best of the three. Patch of bright light on water requires toning down by rubbing negative with bit of soft rag moistened with methylated spirit. 2. You have overcrowded picture space with too many objects, flowers, etc. These on so small a scale irritate rather than please the eye. In nature, their large size and colour makes all the difference. 3. A good subject. Try again. Do not put sitter so near the light. Use a large white sheet as reflector, to soften the light on shadow side of head. Top light seldom satisfactory in portraiture.

H.M.M. (Enfield).—Your pictorial taste is in front of your photographic skill. Better that than the other way round. The original from which this enlargement was made was evidently not exposed quite enough. For enlarging, one wants a fully exposed, but not over-developed negative. One rather thin, with detail and delicate gradation, is best (see page 55, *Practical Photographer* No. 2). Mounting tasteful but flimsy. Paste down your mounting paper on to stiff card *before* putting the photograph on it.

J.H.S. (Burmantofts).—1. Sky too dark for so much light on near parts of road. Try a light sunset sky with sun behind trees to right. Mounting neat. Mount not dark enough for strong contrast effect. 2 and 3. Both technically very creditable. Your printing process does not make the best of your negatives. Try a rough surface sepia platinotype. Colours are too strong, too red. In 2, get the left lower corner to print somewhat darker.

W.B.C. (Bowden).—Do not use cut-out mounts with white bevel. This light line catches the eye and takes it away from the print. All three are excellent technical results, but pictorially faulty. Horizon too high. Due to camera being too high from ground. In 3, the figure is staring at camera. This should be avoided whenever possible. Prints are lacking in suggestion of atmosphere or distance. Slip-in (and slip-about) mounts are only intended for lazy people.

W.W. (Skipton).—1. Too much minute detail for good pictorial effect. The basis of picture making is the art of leaving out (see note on Mr. Cadby's work, No. 3 *Practical Photographer*). The detail here shown would be admirable in a scientific subject. 2. Much better. The sky is too dark and gloomy. This is emphasised by the light margin. Mount is too near the same colour as print. They weaken each other. 3. Technically good. Too symmetrically arranged. Camera too high from ground. making ground *seem* to rise up. Do not use ink for writing titles. Pencil or crayon better.

Print criticisms sent by post to J.A.G. (Bala), H.S.B. (Canterbury), C.B. (Newbury), M.S. (Glasgow) and J.M. (Old Meldrum).

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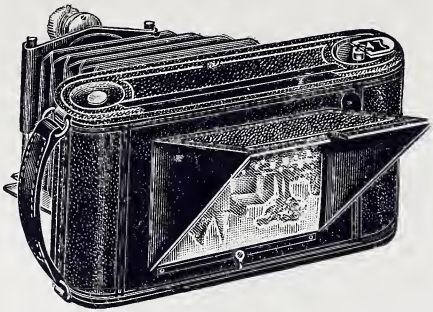

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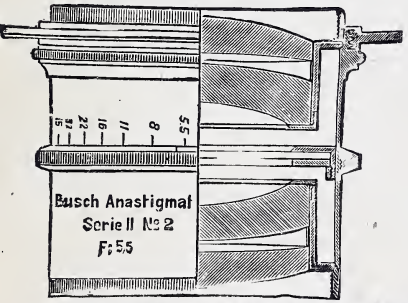

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2	$1\frac{1}{2}$	$1\frac{1}{8}$	8	$6\frac{1}{2} \times 4\frac{3}{4}$	$10\frac{3}{4} \times 8\frac{1}{4}$	12	1 13 0	1 8 0
3	$1\frac{1}{2}$	$1\frac{3}{8}$	10	$8\frac{1}{2} \times 6\frac{1}{2}$	$12\frac{3}{4} \times 10\frac{1}{4}$	16	2 5 0	2 0 0
4	$2\frac{1}{4}$	$1\frac{5}{8}$	12	11 × 9	16 × 12	19	3 0 0	—
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6		3	24	15 × 12	24 × 20	31	8 15 0	—

This Coupon Expires December 31st, 1903.

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Prints (or Negatives) for Criticism.

RULES.

1. Write legibly, on one side of the paper only.
2. Put your name, address, and a number on the back of each print.
3. Do not send more than three prints with one coupon.
4. State the *Month*, *Hour*, *Light*, *Plate Speed*, *Stop*, *Exposure*, *Developer*, *Printing and Toning* process employed.
5. If prints or negatives are to be returned, a stamped and addressed label or envelope must be sent.
6. The Editor reserves the right of reproducing any print sent in for criticism.
7. Prints or negatives should be addressed :—THE EDITOR OF "THE PRACTICAL PHOTOGRAPHER" (Print Criticism), 27, PATERNOSTER ROW, LONDON, E.C.

Lantern Slide Competition.

A Silver Medal, Bronze Medal, and Certificates will be placed at the disposal of the Judges.

1. This competition is designed to direct the attention of readers to experiments in connection with the making of lantern slides. Marks will be given for successful examples of any of the methods contained in this number; or any useful modification; or any other helpful methods of lantern slide making.
2. Prize Winning Slides will not be returned. Others will be returned if a properly stamped and addressed label be sent with the slides and coupon in this number.
3. Each slide should bear its title and name of producer, and be accompanied by a legibly written brief description of its preparation, viz. : Exposure, Developer, Toning Process, Brand of Plate, Light, etc., etc.
4. Competitors may submit one, two or three (but not more) slides with each coupon.
5. The Editor reserves the right to reproduce any slide sent in to the competition.
6. Slides may be sent in any time not later than February 1st, 1904, addressed :—

The Editor of *The Practical Photographer*,
(Lantern Slide Competition),
27, Paternoster Row, London, E.C.

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A New Lens.—We have received advance notice of a new series of anastigmat lenses by Aldis Brothers, Birmingham. This new form gives an improved covering power with great rapidity, etc. For instance, No. 7, Series III., 7½ in. equivalent focus, 6·7 in. back focus from flange *f*/7·7, covering ½-plate, fitted with B. & L. Unicum Shutter, pneumatic bulb, will be sold for the conspicuously tempting price of 3 guineas. We hope to have an early opportunity of trying this lens, which we feel confident will prove worthy of the high reputation of this firm.

"Antinous" Shutter Release (Messrs. Watson, High Holborn). A most ingenious and efficient substitute for the usual rubber tube of "proverbial perishable proclivities." The antinous is made almost entirely of metal; flexible, simple, efficient, compact. Nothing in the least likely to get out of order. Made in two forms. One form suitable for attaching to a "B. & L." Shutter or others of that type, another for the "T.-P." roller-blind types. This modest priced apparatus (2/6) has only to be seen to be appreciated and very probably purchased. (Messrs. Houghton, Holborn, Agents.)

Wallsgrove Perfected Developer, in powder form, readily soluble. A one shilling box contains 8 pairs of powders in packets. Each of the pairs is dissolved in 3 oz. water and equal parts of these solutions taken. An excellent developer results. A small packet of "Bromide" is also provided. Extremely convenient for the traveller or those workers who do not care to keep large stocks of solutions. P.S.—An interesting *Experimental Competition* (money prizes) is in preparation. Details will be issued later.

Photographic Lenses.—A Simple treatise by Conrad Beck and Herbert Andrews. (Percy Lund, Humphries & Co., Ltd., 1s.) One of the very best shilling's worth that any photographer is likely to have the chance of obtaining. A well-printed, bound book of 288 pages and 156 illustrations; packed with thoroughly sound and valuable practical information from cover to cover. The nature of some of the sections may be mentioned, *e.g.*, Functions of a Lens, Glass, Corrections, Properties of Lenses, Types of Lenses, Lenses for special purposes, Lens Testing. These will be sufficient to show the wide scope of the work. Indeed, it would be no easy task to mention any practical point appertaining to the photographer's use of lenses that is not dealt with in its pages. An *edition de luxe* contains several elegantly executed photogravures. This book should certainly have a place in every practical photographers' library.

Staley's New Projection Lens should be of special interest to readers of this number. It is provided with a set of orange, green, red and blue glasses fitted to a rotating disc in front of the lens. This enables the operator to introduce any one of these glasses before the lens mouth, and so give a coloured or general hue to the picture at a moment's notice. On the subject of coloured glass, diagram slides and so forth, see page 45 *et seq.*

The Austin-Edwards H.S. (high speed) Film is said to be the fastest film ever made. Not being able to compare it with *all* the other films ever made, we cannot affirm or refute this claim. But this much we can say from personal trial, viz., that it is of not only a remarkably high speed, but also of very fine quality indeed. It was only a gloomy November morning that our trials were made in connection with some portraiture experiments in ordinary rooms. The results, compared with those on a certain brand of rapid plates, were indeed an agreeable surprise to us.

Primus Lanternists' Pocket Book.—Another seasonable arrival from Messrs. Butcher. This attractive little book, published at 6d., will be sent to readers of *The Practical Photographer* who will (1) mention that fact and (2) also send 2d. in stamps to cover postage. The book contains quite a fund of useful information, reference tables, addresses, etc., and is also a diary pocket book as well. Note the address: Camera House, Farringdon Avenue, E.C.

Messrs. Griffin & Sons have submitted to us for trial their "Cyko" Camera. This is of the magazine type. Beck's R.R. Lens, *f*/8; Unicum Shutter, 1 sec. to $\frac{1}{100}$ sec.; Finders; Scale of Distances; Focussing arrangement; Plates in metal sheaths; simple and reliable changing apparatus. After several crucial tests, we come to the conclusion that this is an instrument we can thoroughly recommend. Price £3 3s.

Kodoid Plates.—A sample package of Kodoid plates (otherwise films) from Messrs. Kodak, shows us that the high quality of these films is as good, if not better, than when we first tried them several months ago. Kodak plates, in our opinion, are of *especial* value for all subjects possessing great light and shade contrasts, such as interiors or snow scenes.

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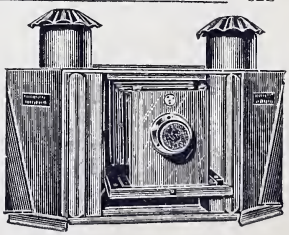

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Ozotype as a printing process has not yet received the general attention that it well deserves, seeing that it puts certain powers in the picture maker's hands that he cannot otherwise obtain. Threepence sent to the Ozotype Company, 1, Weedington Road, London, N.W., will secure a copy of the latest manual on the subject, entitled "Instruction in Ozotype" (written by the inventor of the process). It is difficult to imagine a more simple and practical booklet.

Portraiture for Amateurs without a Studio. By Rev. F. C. Lambert, M.A. (Editor of *The Practical Photographer*) Hazell, Watson & Viney. 2 vols., 1s. each. Matthew Surface writes as follows:—"Mr. Lambert deserves no small measure of thanks for his recent volumes, in which every step of amateur portraiture is detailed and explained. We do not know any other work by which a novice can so readily gain instruction in home portraiture, and we strongly recommend a study of its pages.

Elementary Chemistry of Photographic Chemicals by C. Sorder Ellis, F.C.S., F.I.C. Hazell, Watson & Viney, 1/0. A convenient book of reference which may be made more useful by a little careful revision. One regrets the indiscriminate use of the minus sign as a bond between water of crystallization and the dry salt, at the beginning of a paragraph, and in place of a semi-colon. May not the beginner be confused by the use of bichromate of potash on one page and potassium bichromate on another.

Art of Retouching, by J. Hubert, F.R.P.S. Hazell, Watson & Viney, 1/-. Doubtless this will be of some service to those who wish to improve their faulty portrait negatives. The book also contains a chapter on portraiture.

From Messrs. Chas. Zimmerman (9 and 10. St. Mary at Hill, E.C.), we have received some samples of gaslight printing post cards, matt surface. Each packet contains 12 cards, one circular and one rectangular mask, selling at 10d. per packet. We have also to thank this firm for sending us an admirably arranged and comprehensive price list.

A Catalogue containing a vast array of things useful, large and small, for making enlargements and lantern slides, from Messrs. Houghton, 88, High Holborn. The slide maker will herein find many little items which save time and trouble and keep to better work. Many of the aids herein mentioned simplify procedure, reduce the number of waste plates, and so in the end prove themselves as money savers.

From Messrs. Houghton & Sons, 88, High Holborn, comes a packet of post-cards bearing tasteful designs and seasonable greeting printed on the front, while the back is sensitized for photographic printing. Price, 1/- per packet. They have also a tasteful selection of photographic calendars.

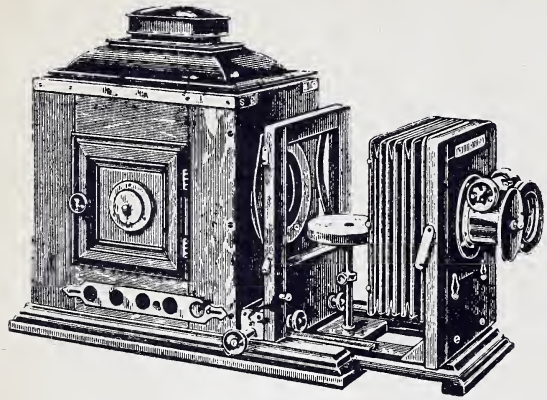
From Mr. W. C. Hughes, 82, Mortimer Road, Kingsland, London, N., comes a well-got-up price list of anything and everything that the lanternist is likely to want. Mr. Hughes is well-known as a lantern specialist, and his advice is well worth having upon topics in connection with his speciality.

Messrs. Sanders & Crowhurst, 71, Shaftesbury Avenue, send us their list of lantern slides, embracing long series of birds, of Westminster Abbey, and of the Ober-Ammergau Passion Play. The prices per slide are from 1/- to 7/6.

A Photographic Exhibition will contribute to the inauguration of the Cartwright Memorial Hall, Bradford. The Exhibition Committee includes a brave array of Royal Academicians among other great names. The Photographic Section is under the able guidance of Mr. Alex. Keighley, F.R.P.S. We hope to include in the next number of *The Practical Photographer* a choice selection of his justly renowned pictorial work.

Burnley Camera Club Exhibition, January 21-23. Hon. Sec.: B. Slater, Wood Nook, Burnley.

The "Hanover" Lecture Lantern



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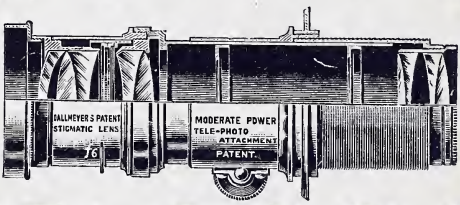

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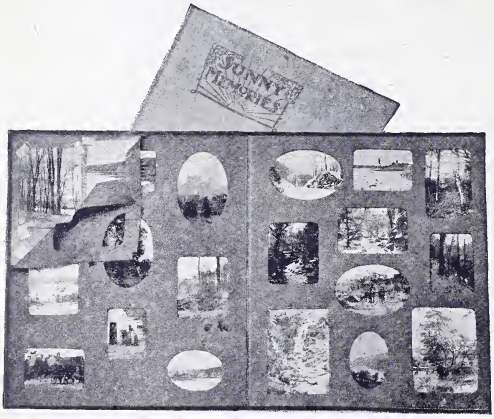

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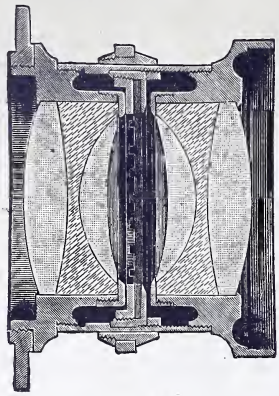

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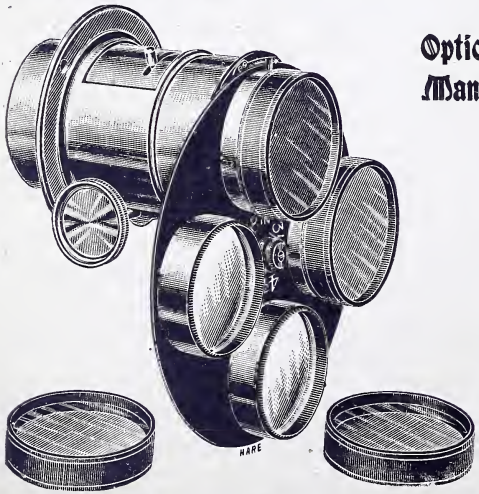

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